Mini System **FWV357/55/98**

Service
Service
Service

Service Manual

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COMPACT disc DIGITAL AUDIO ReWritable

COMPACT disc DIGITAL AUDIO Recordable

COMPACT disc DIGITAL AUDIO

MP3-CD PLAYBACK MP3

VIDEO CD

CLASS 1
LASER PRODUCT

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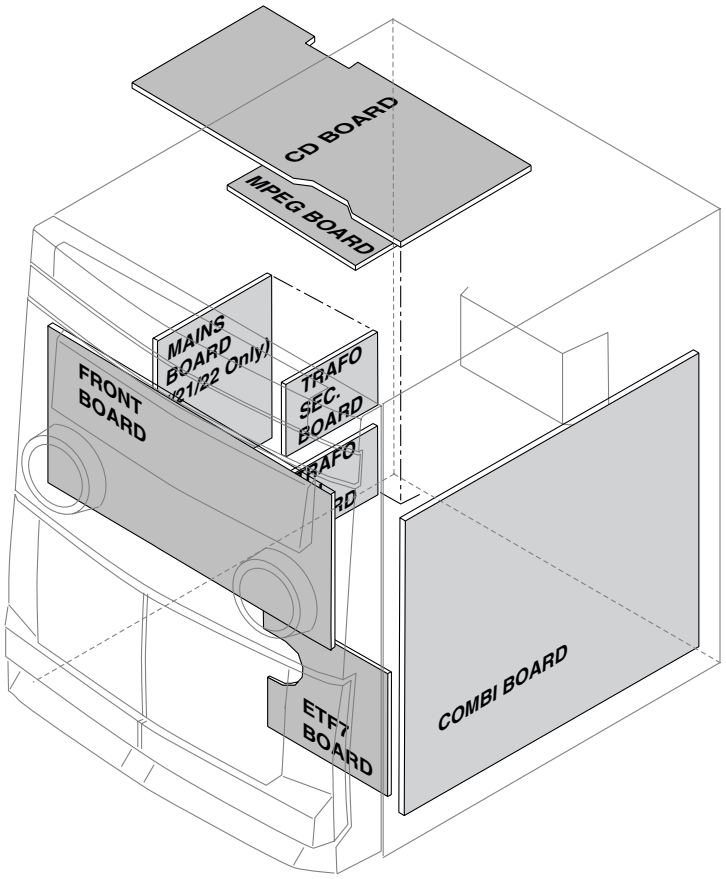
Version 1.0

PHILIPS

LOCATION OF PC BOARDS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	FWV357							
	/55	/98						
Karaoke	x	x						
News								
RDS								
Incredible Surround								
Rotary Encoder (volume control)	x	x						
Jog Shuttle	x	x						
Voltage Selector	x	x						
Aux / CDR Input	x	x						
Video Output	x	x						
Headphone Socket	x	x						
Line Output								
Subwoofer Output								
Surround Output								
Matrix Surround Loudspeakers								
Standby - FTD Clock Display	x	x						
ECO Standby - Dark								
Combi - Non-Cenelec Tuner	x	x						
Combi - Cenelec Tuner								
Mains Board (Chapter 5)	x	x						
MP3-CD Play	x	x						
Video CD Play	x	x						

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable
Mains frequency : 50/60Hz
Power consumption : < 80W Active
< 15W at Standby with Clock on
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 365mm

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
100kHz
IF frequency : 10.7MHz ± 20kHz
Aerial input : 75Ω coaxial
Sensitivity at 26dB S/N : < 7μV
Selectivity at 600kHz bandwidth : > 25dB
IF rejection : > 60dB
Image rejection : > 25dB
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8μV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz
530-1700kHz
Grid : 9kHz/10kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.4mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

AMPLIFIER:

Output power : 2 x 40W RMS [2]
2 x 33W FTC [3]
Frequency response within -3dB : 50Hz-15kHz
Dynamic Bass Boost : DBB ON, DBB 1, DBB 2, DBB 3 [4]
Digital Sound Control : Jazz, Techno, Optimal, Rock [4]
Headphone output, R_{LOAD} = 32Ω : 15mW ± 2dB
Input sensitivity, R_S = 600Ω
Aux / CDR : 500mV / 1.0V
Mic : {3.5mV}

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec +2.5/-1.5%
Wow and flutter : < 0.4% DIN
Fast-wind/rewind time C60 : 130 sec
Bias system : 78kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio Type I : > 48dBA

VCD/COMPACT DISC:

Audio Performance:

Measurement done at output conn. of the 3CDC module.
Frequency response within 3dB : 20Hz - 20kHz
Output level (in Vrms) : 500mV ± 1.5dB, R_{out} = 100Ω
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.003%
Channel unbalance at 1kHz : ±1dB
Channel separation at 1kHz : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)
MPEG 1 Layer 3 (MP3-CD) : MPEG AUDIO
MP3-CD bit rate : 56-256 kbps
MP3-CD sampling frequencies : 32kHz, 44.1kHz, 48kHz
Recording Format : ISO 9660
UDF format not supported.

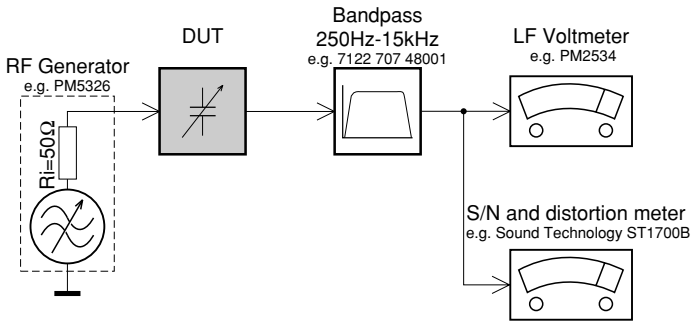
Video Performance *(for VCD version only)***:**

Video output level : 1.0V ± 0.2V
Luminance non-linear distortion : < 0 ± 5%
Luminance S/N ratio : > 50dB

[1] Default setting is OFF, to switch on please refer page 3-1.
[2] 6Ω, 1kHz, 10% THD
[3] 6Ω, 60-12500Hz, 10% THD
[4] Frequency response in each setting is software controlled.

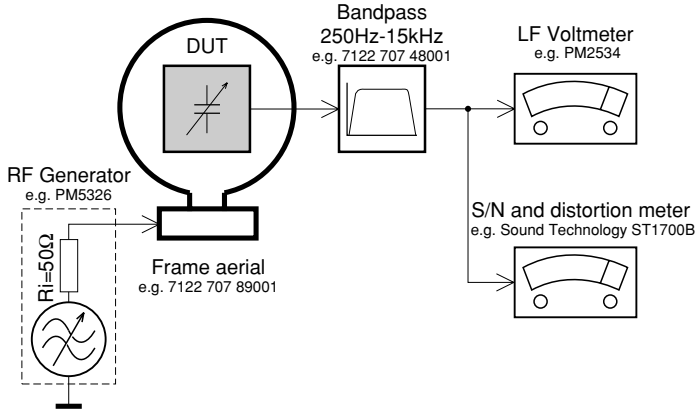
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

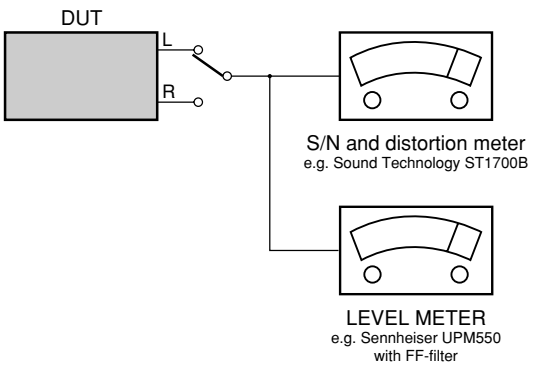
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

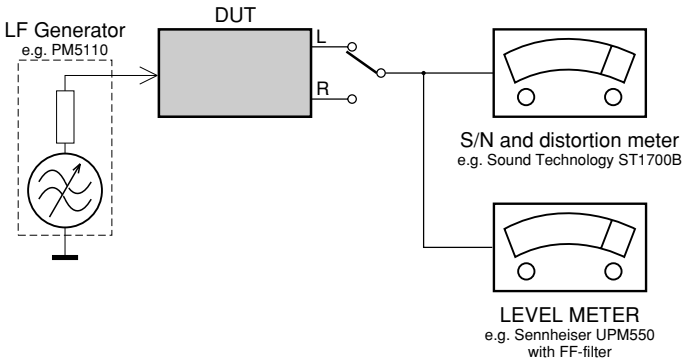
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder 4822 395 91019
Torx bit T10 150mm 4822 395 50456
Torx driver set T6 - T20 ..... 4822 395 50145
Torx driver T10 extended 4822 395 50423

Cassette:

SBC419 Test cassette CrO2 ..... 4822 397 30069
SBC420 Test cassette Fe 4822 397 30071
MTT150 Dolby level 200nWb/M 4822 397 30271

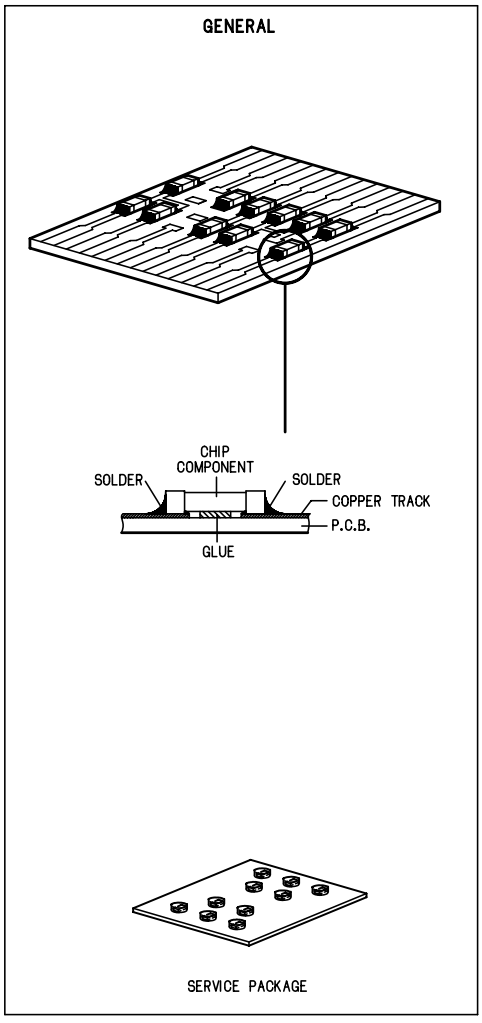
Compact Disc:

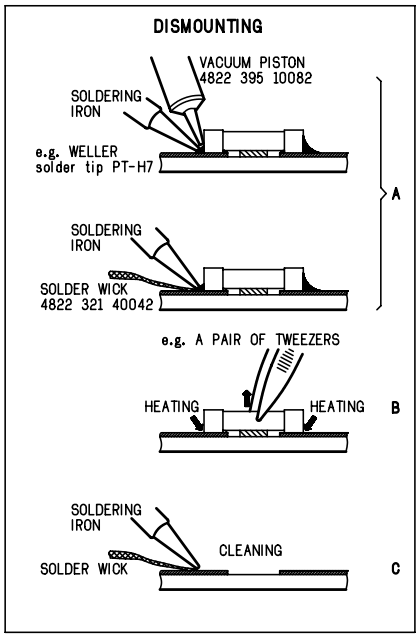
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

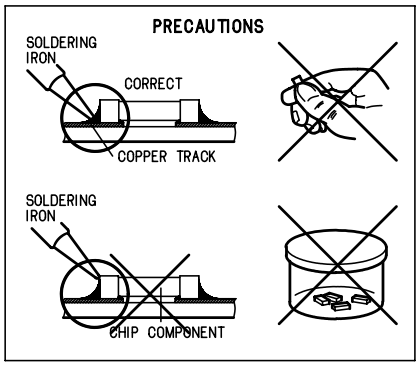
ESD Equipment:

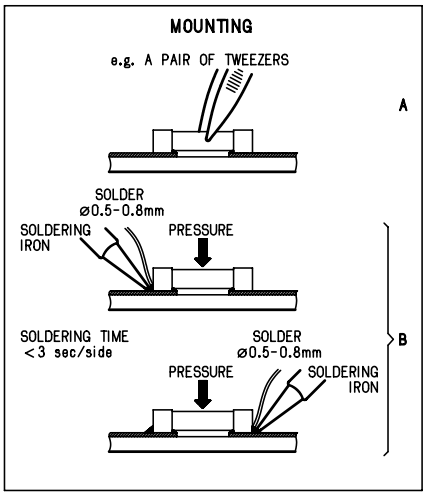
Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connector box (1MΩ) 4822 320 11307
Extension cable
(to connect wristband to conn. box) 4822 320 11305
Connecting cable
(to connect table mat to conn. box) 4822 320 11306
Earth cable (to connect product to mat or box) 4822 320 11308
Complete kit ESD3
(combining all above products) 4822 320 10671
Wristband tester 4822 344 13999

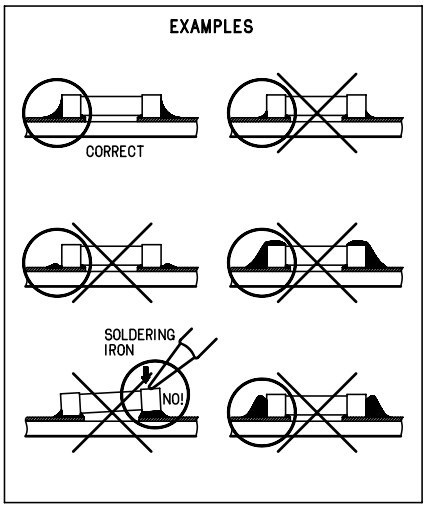
HANDLING CHIP COMPONENTS











ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

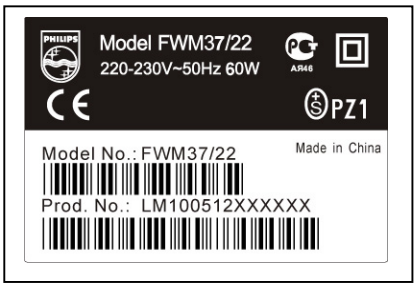
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

INFORMATION ABOUT LEAD-FREE SOLDERING

Philips CE is producing lead-free sets from 1.1.2005 onwards.
IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:

Example S/N:



Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 2005 wk12

So from 0501 onwards = from 1 Jan 2005 onwards

***Important note*: In fact also products of year 2004 must be treated in this way as long as you avoid mixing solder-alloys (leaded/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.**

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.

- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).
  If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website.
  Do not re-use BGAs at all.

- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.

- On our website **www.atyourservice.ce.Philips.com** you find more information to:

  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets

  You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

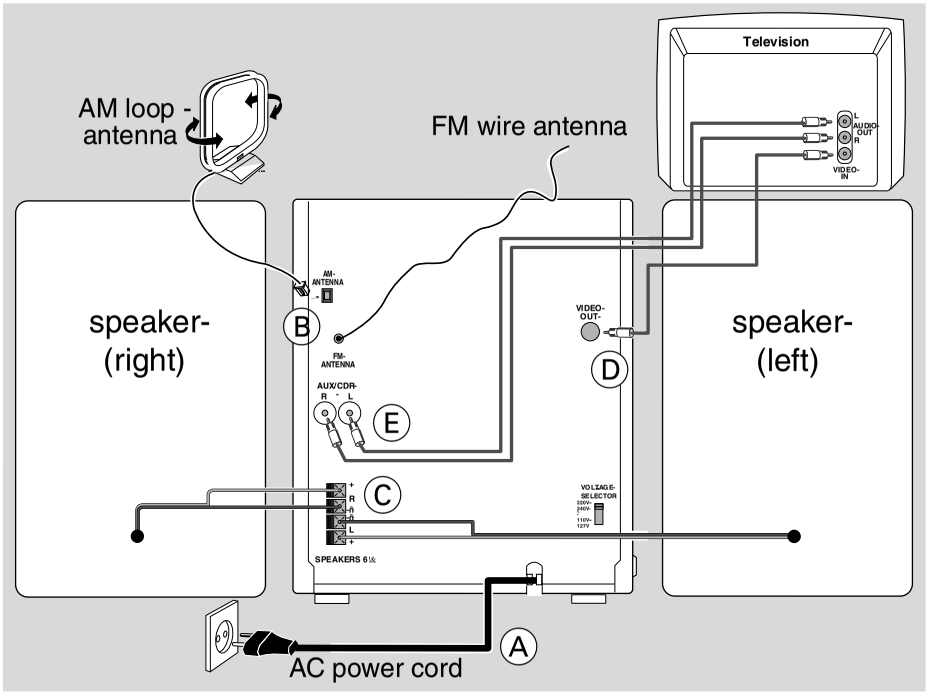
SERVICE INSTRUCTION

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):

1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.

- Check the cabinet for defects, to avoid touching of any inner parts by the customer.



Rear connections

The type plate is located at the rear of the system.

Ⓐ Power

Before connecting the AC power cord to the wall outlet, ensure that the following are done;

– If your system is equipped with a Voltage Selector, set the VOLTAGE SELECTOR to the local power line voltage.

– All other connections have been made.

WARNING!

– For optimal performance, use only the original power cable.

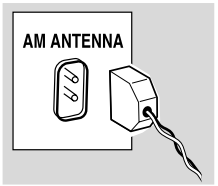
– Never make or change any connections with the power switched on.

Ⓑ Antennas Connection

AM Antenna

Connect the supplied AM loop antenna to the "AM ANTENNA" terminal.

Position the antenna as far as possible from a TV, VCR or other radiation source.



FM Antenna

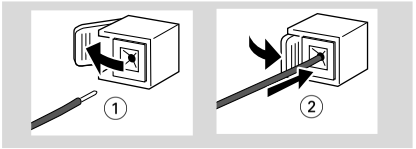
It is unnecessary to connect the FM pigtail antenna since it is fixed to the main unit.

Adjust the FM antenna for optimal FM stereo reception.

Ⓒ Speakers Connection

Front Speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "R" and left speaker to "L", coloured (marked) wire to "+" and black (unmarked) wire to "–".



Fully insert the stripped portion of the speaker wire into the terminal as shown.

Notes:

– For optimal sound performance, use the supplied speakers.

– Do not connect more than one speaker to any one pair of + / – speaker terminals.

– Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

Ⓓ Video Out Connection

Connect the **VIDEO OUT** terminal at the rear of the system to the TV or VCR VIDEO IN for viewing or recording.

Note:

– To avoid magnetic interference with the picture on your TV, do not position the front speakers too close to the TV.

Ⓔ Connecting other equipment to your system

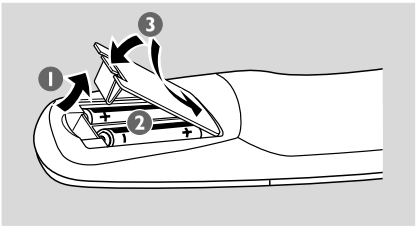
Use a cinch cable to connect **AUX/CDR IN** to the analogue audio out terminals of an external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder).

Note:

– If you are connecting equipment with a mono output (a single audio out terminal), connect it to the AUX/CDR IN left terminal. Alternatively, you can use a "single to double" cinch cable (the output sound still remain mono).

Inserting batteries into the remote control

Insert two batteries type R06 or AA into the remote control with the correct polarity as indicated by the "+" and "–" symbols inside the battery compartment.

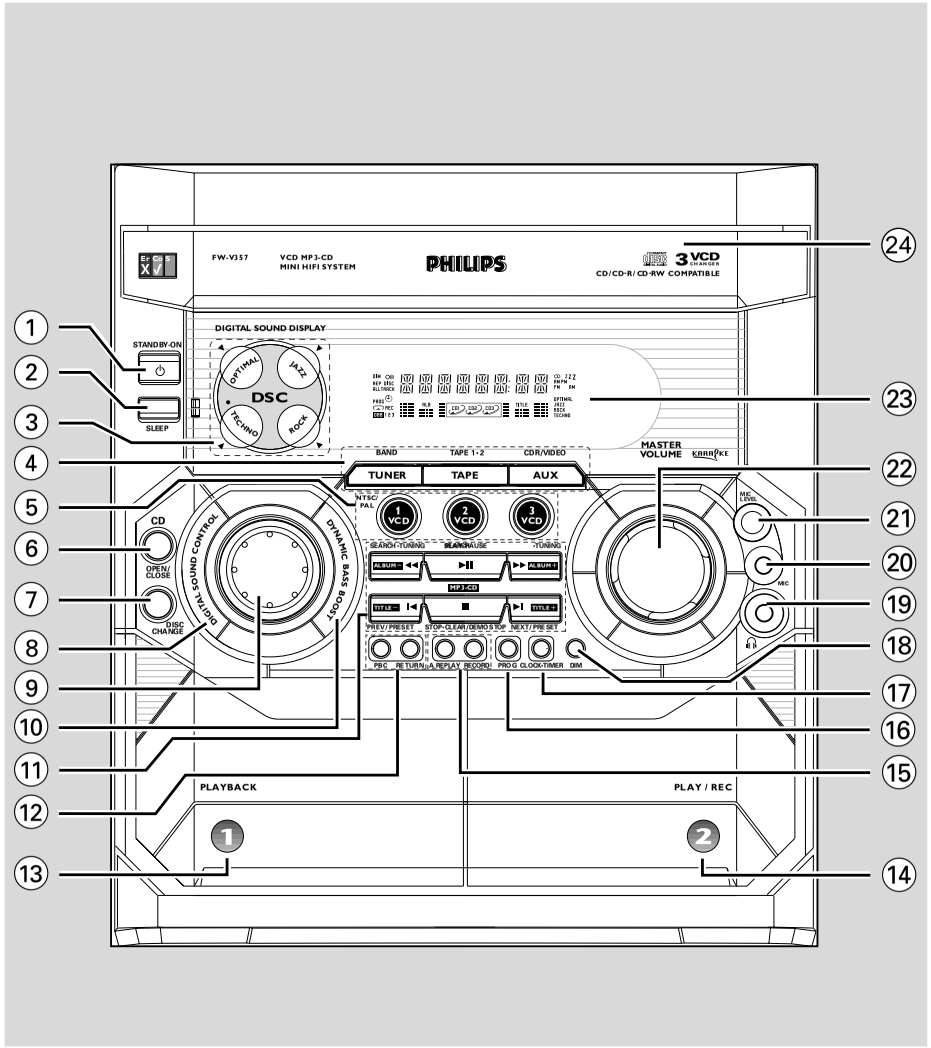


CAUTION!

– Remove batteries if they are exhausted or will not be used for a long time.

– Do not use old and new or different types of batteries in combination.

– Batteries contain chemical substances, so they should be disposed off properly.



Controls

Controls on the system and remote control

① **STANDBY ON** ⏻
– to switch the system on or to standby mode.

② **SLEEP**
– to activate/deactivate or set the sleep timer.

③ **DIGITAL SOUND DISPLAY**
– the active DSC will be lighted.

④ **TUNER** (BAND)
– to select waveband : FM or MW.

TAPE (TAPE 1•2)
– to select tape deck 1 or 2.

AUX (CDR/VIDEO)
– to select the input for an additional appliance.

⑤ **VCD 1 / 2 / 3**
(VCD.CD 1/2/3 - MP3.CD 1/2/3)
– to select disc tray 1, 2 or 3.

VCD 1 (NTSC/PAL)
– *(on the system only)* to select corresponding video output for NTSC or PAL system of your TV set (except Multi-system TV).

⑥ **OPEN/CLOSE**
– to open or close the disc tray.

⑦ **DISC CHANGE**
– to change disc(s).

⑧ **DIGITAL SOUND CONTROL (DSC)**
– to activate the jog control for DSC selection.

⑨ **Jog control**
– to select the desired sound effect for the selected sound feature.
DSC ..... JAZZ, ROCK, TECHNO or OPTIMAL.
DBB ..... DBB 1, DBB 2, DBB 3 or DBB OFF.

⑩ **DYNAMIC BASS BOOST (DBB)**
– to activate the jog control for DBB selection.

⑪ **Mode Selection**

PLAY•PAUSE ▶II
for CD/VCD/MP3-CD…to start or interrupt playback.
for Tape ..... to start playback.
for Plug & Play…*(on the system only)* to initiate and start plug & play mode.

SEARCH•TUNING ◀◀ (ALBUM −)
SEARCH•TUNING ▶▶ (ALBUM +)
for MP3-CD ..... to select previous/next album.
for VCD ..... to move the zoomed picture to the left or right.
for CD/VCD .... to search backward/forward.
for Tuner ..... to tune to a lower or higher radio frequency.
for Tape ..... to rewind or fast forward.
for Clock ..... *(on the system only)* to set the hour.

STOP•CLEAR / DEMO STOP ■
for CD/VCD/MP3-CD…to stop playback or to clear a programme.
for Tuner ..... *(on the system only)* to stop programming or to erase a selected preset.
for Tape ..... to stop playback or recording.
for Demo ..... *(on the system only)* to activate/ deactivate the demonstration.
for Clock ..... *(on the system only)* to exit clock setting or cancel timer.
for Plug & Play…*(on the system only)* to exit plug & play mode.

PREV ⏮ / PRESET ▼ (TITLE −)
NEXT ⏭ / PRESET▲ (TITLE +)
for MP3-CD ..... to select previous/next title.
for VCD ..... to move the zoomed picture down or up.
..... to select next or previous menu or track during playback *(for VCD with PBC switched on)*.
for CD/VCD .... to skip to the beginning of the current, previous, or next track.
for Tuner ..... to select a preset radio station.
for Clock ..... *(on the system only)* to set the minute.

⑫ **VCD operations** *(for VCD version 2.0 only)*

PBC

– to switch on or off the playback control mode.

RETURN

– to return to the previous menu level during playback (for VCD with PBC switched on).

⑬ **Tape deck 1**

⑭ **Tape deck 2**

⑮ **Tape deck operations**

A. REPLAY

– to select continuous playback in either AUTO REPLAY or ONCE mode only.

RECORD

– to start recording on tape deck 2.

⑯ **PROG**

for CD/VCD/MP3-CD…to programme disc tracks.
for Tuner ..... to programme preset radio stations.
for Clock ..... to select 12- or 24-hour clock mode.

⑰ **CLOCK•TIMER**

– to view the clock, set the clock or set the timer.

⑱ **DIM**

– to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.

⑲

– to connect headphones.

⑳ **MIC**

– to connect microphone jack.

㉑ **MIC LEVEL**

– to adjust the mixing level for karaoke or microphone recording.

㉒ **MASTER VOLUME (VOLUME + / −)**

– to increase or decrease the volume.

㉓ **Display screen**

– to view the current status of the system.

≤ **Disc tray**

∞ **VCD operations** *(on remote control only)*

OSD

– to switch on or off the On Screen Display on the TV.

ZOOM

– to enlarge a still picture of the VCD on the TV screen.

RESUME

– to continue playback again from where you have stopped (for VCD with PBC switched off).

VOCAL

– to fade out the original vocal from a Karaoke VCD or to switch between mono or stereo mode during audio disc playback.

KEY CONTROL (♭ ♮ ♯)

– to change the VCD key tone level to suit your vocal range.

♭ ..... to decrease the key tone level.
♮ ..... to restore the key tone level to original setting.
♯ ..... to increase the key tone level.

ECHO − / +

– to adjust the VCD echo level for karaoke after inserted the microphone.

SLOW

– to watch the VCD at a slower speed.

A - B

– to playback a certain scene or passage of a CD/ VCD repeatedly.

DIGEST

– to scan through a VCD or a specific track.

㉖ **IS** *(not functional for this model)*

Controls

㉗ **REPEAT**

– to playback track/disc/programme repeatedly.

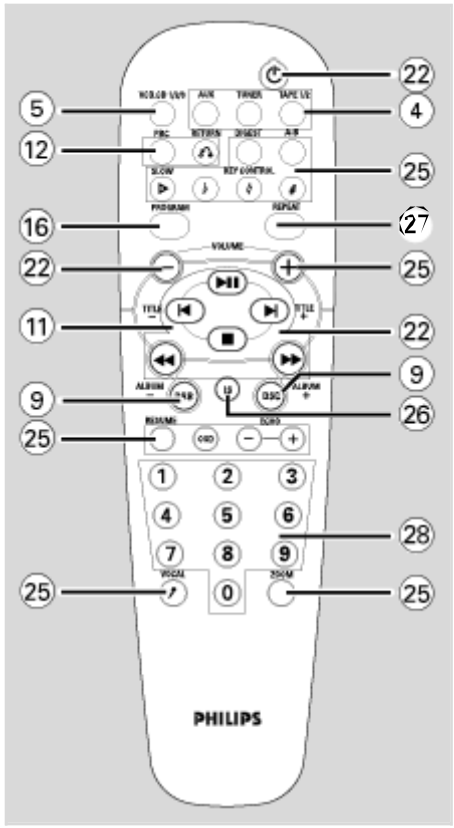
㉘ **Numeric keys (0 – 9)**

(numbers consisting more than two figures must be keyed in within 2 seconds.)

– to direct key in a track number for CD/VCD/MP3-CD.

㉙

– to switch the system to standby mode.



Notes for remote control:

– First select the source you wish to control by pressing one of the source select keys on the remote control (for example TAPE 1/2, TUNER).

– Then select the desired function (for example ▶, ⏮, ▶).

Troubleshooting

WARNING

Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair. If you are unable to solve a problem by following these hints, consult your dealer or service centre.

Problem	Solution
CD OPERATION	
"UNREADABLE DISC" **is displayed.**	– Check if the disc is inserted upside down. – Wait until the moisture condensation at the lens has cleared. – Replace or clean the disc, see "Maintenance". – Use a finalised CD-RW or a correct MP3-CD format disc.
"NO DISC" **is displayed.**	– Insert a disc.
No picture on TV screen.	– Connect the cable betwen the system and TV.
No colour on TV screen.	– Change the system to the respective PAL or NTSC setting.
Cannot adjust the TV system to PAL or NTSC.	– Remove the MP-3 CD from disc tray 1 or press DISC CHANGE to select a non MP3 disc tray
RADIO RECEPTION	
Radio reception is poor.	– If the signal is too weak, adjust the antenna or connect an external antenna for better reception. – Increase the distance between the Mini HiFi System and your TV or VCR.
TAPE OPERATION/RECORDING	
Recording or playback cannot be made.	– Clean deck parts, see "Maintenance". – Use only NORMAL (IEC I) tape. – Apply a piece of adhesive tape over the missing tab space.
The tape deck door cannot open.	– Remove and reconnect the AC power plug and switch on the system again.

Troubleshooting

GENERAL	
The system does not react when buttons are pressed.	– Remove and reconnect the AC power plug and switch on the system again.
Sound cannot be heard or is of poor quality.	– Adjust the volume. – Disconnect the headphones. – Check that the speakers are connected correctly. – Check if the stripped speaker wire is clamped. – Make sure the MP3 disc was recorded within 32-256 kbps bit rate with sampling frequencies at 48 kHz, 44.1 kHz or 32 kHz.
The left and right sound outputs are reversed.	– Check the speaker connections and location.
The remote control does not function properly.	– Select the source (VCD 1/2/3 or TUNER, for example) before pressing the function button (▶ ,I◀◀,▶▶I). – Reduce the distance between the remote control and the system. – Insert the batteries with their polarities (+/– signs) aligned as indicated. – Replace the batteries. – Point the remote control directly towards the IR sensor .
The timer is not working.	– Set the clock correctly. – Press and hold CLOCK•TIMER to switch on the timer. – If recording or tape dubbing is in progress, stop recording.
The Clock/Timer setting is erased.	– Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.
The system displays features automatically.	– Press and hold ■ on the system to switch off the demonstration.

DISMANTLING INSTRUCTIONS

Dismantling the 3CDC Module

1) Loosen the 4 screws, slide Cover top (pos 255) towards the rear and remove it upwards.
2) Loosen 3 screws slide the Panel right (pos 254) towards the rear and remove it outwards. Do likewise for the Panel left (pos 253).
3) Push the gear slowly towards the front as shown in figure 2 until the CDC tray starts to move out of the Front Cabinet (pos 101). The CDC tray is now disengage and can be pulled out completely.
4) Remove the Cover Tray (pos 106) as shown in figure 1.
5) Loosen 4 screws A to remove the 3CDC-LC-VCD Module (pos 1104) as shown in figure 2.

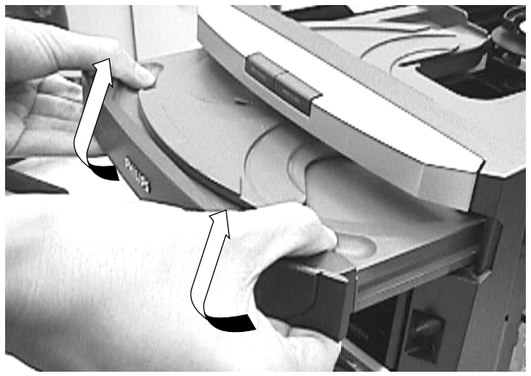


Figure 1

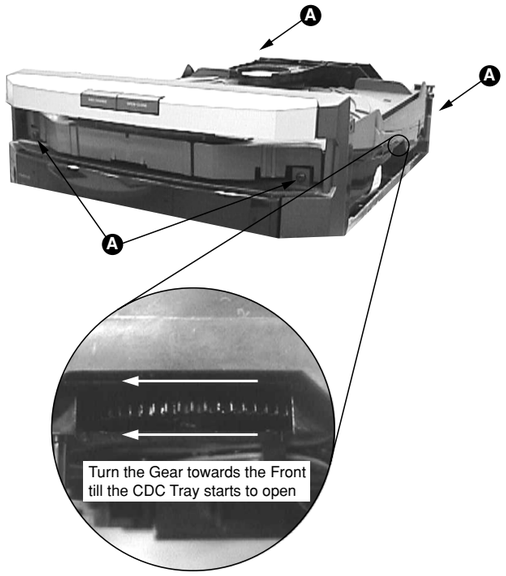


Figure 2

Dismantling of the Volume & Jog Rotary knobs

1) Cut a piece of packaging tape approximately 5cm width by 12cm length and tape its narrow side on to the top and bottom side of the Volume knob (pos 139) as shown in figure 3.
2) Place a small screw driver in between the tape & knob (see figure 3) to give more leverage in pulling out the knob as shown in figure 4.
3) Do likewise for the Jog Rotary knob (pos 138). You may have to rotate the knob to provide the most exposed area during application of the packaging tape.

Figure 3

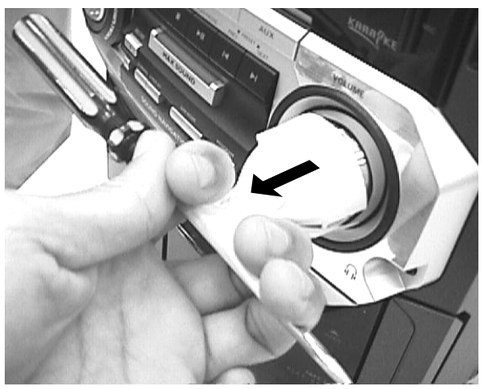


Figure 4

Dismantling of the Front Panel assembly

1) Loosen 2 screws below the Front Panel (pos 101) mounting it to the Bottom plate (pos 265).
2) Release the 2 catches on the sides of the Front Panel to separate it from the Bottom plate.
3) Remove the Volume and Jog Rotary knob if the Front board needs to be dismantled. For Karaoke versions, the Karaoke knob (pos 133) also need to be removed.
4) Loosen 8 screws B to remove the Front board as shown in Figure 5.
5) Loosen 6 screws C and eject both cassette doors to remove the Tape mechanism (pos 1103) as shown in figure 6.

Note: The Cassette door can be removed only after the removal of the Tape mechanism and buttons.

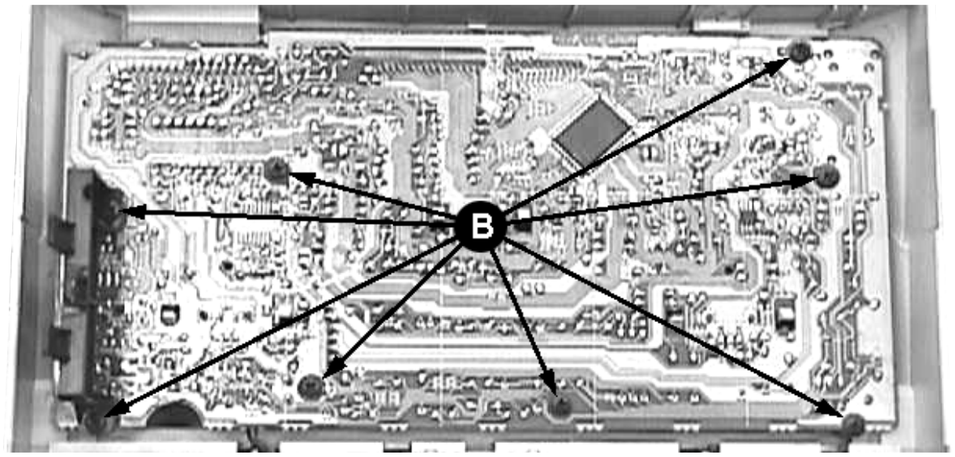


Figure 5

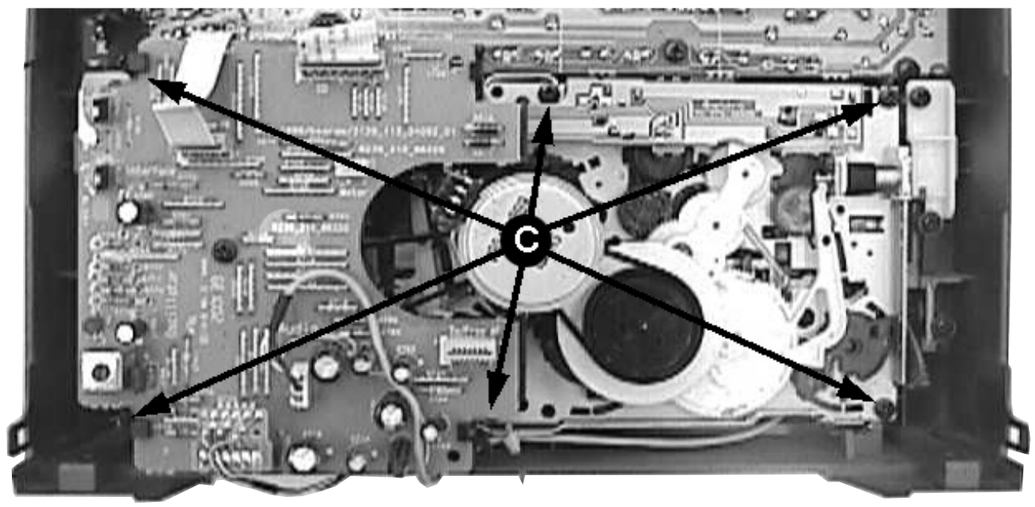


Figure 6

2-2

Dismantling of the Bottom & Rear Panel assembly

1) Loosen 5 screws D mounting the Combi board to the Rear Panel (pos 256) as shown in figure 7.
2) Loosen 3 screws E and release the 2 catches on the sides of the Rear Panel to separate it from the Bottom plate (pos 265).
3) Loosen 4 screws G to remove the Mains Transformer as shown in figure 8.
4) Loosen 2 screws F to remove the Combi Board.

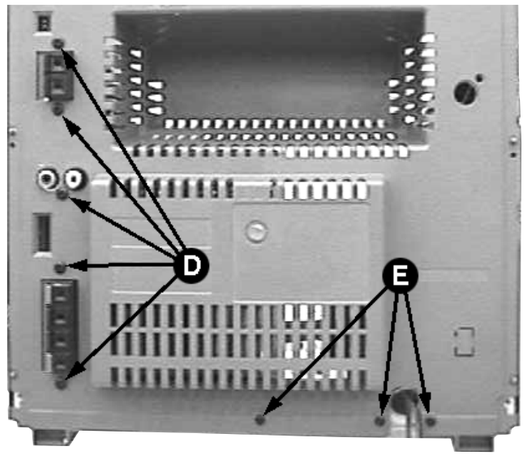


Figure 7

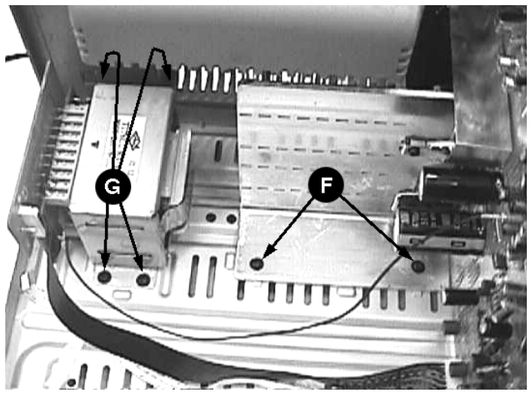


Figure 8

Separating the MPEG and 3CDC-LC-VCD Module

1) Loosen 4 screws P to remove the MPEG shield & MPEG Board as shown in figure 9.
2) Loosen 2 screws M and release catch C3 with a flat screwdriver in the direction as shown to loosen the Plate Insulator.

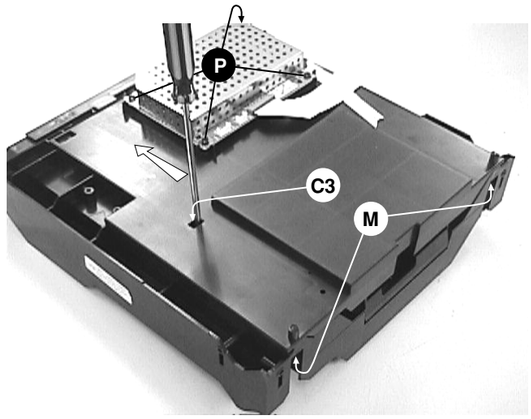
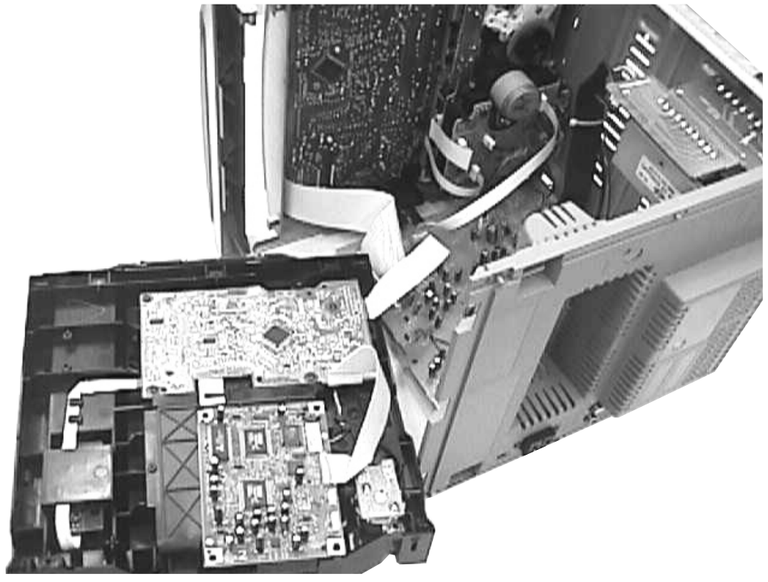
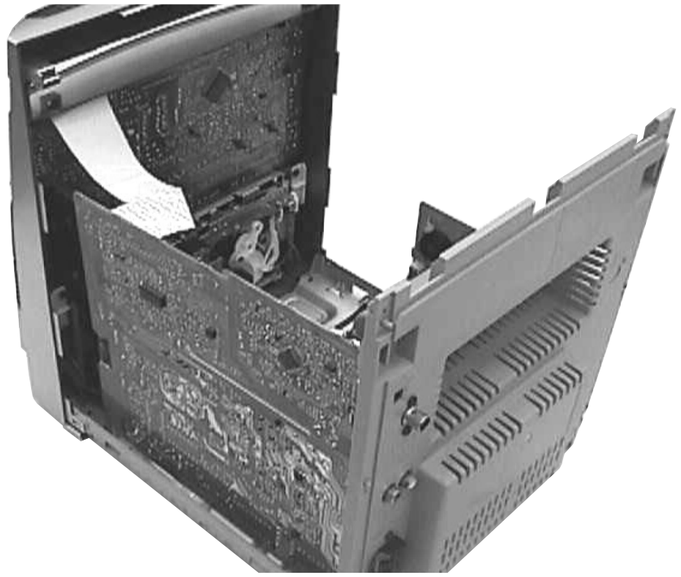


Figure 9

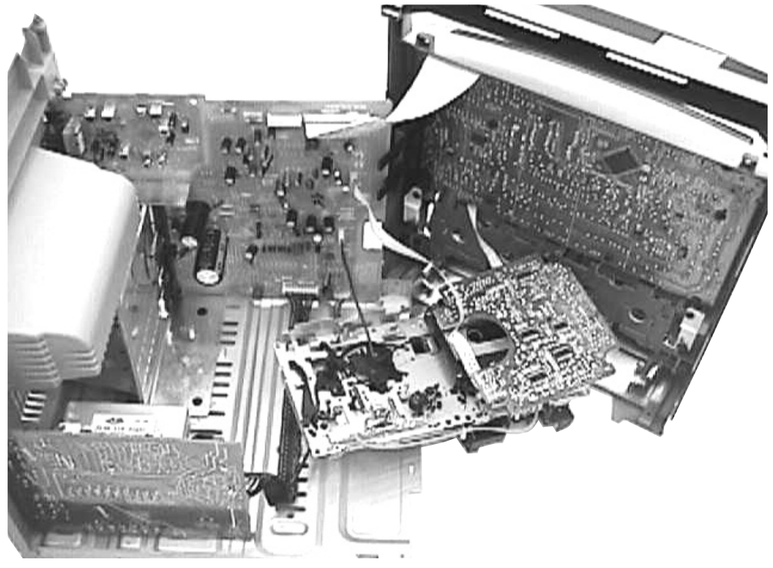
Service pos A



Service pos B



Service pos C

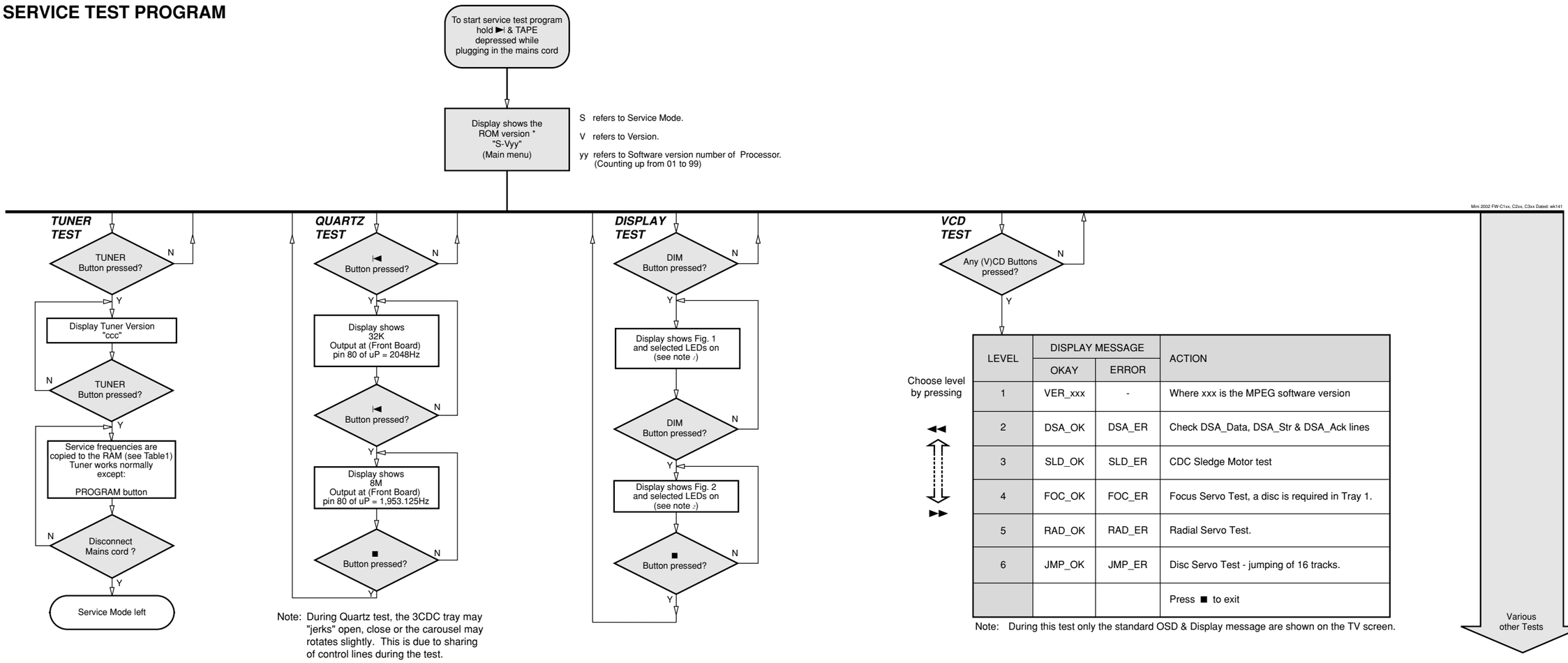


Note: After re-assembly, it is very important to ensure all wires are routed properly to ensure that they do not touch/obstruct all moving parts.

The 3CDC-LC-VCD Module can be complete detached while repairing the other portion of the set.

3-1

SERVICE TEST PROGRAM


To start service test program hold ►| & TAPE depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
S refers to Service Mode.
V refers to Version.
yy refers to Software version number of Processor. (Counting up from 01 to 99)
Mini 2002 FW-C1xx, C2xx, C3xx Dated: wk141
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
|◄ Button pressed?
Display shows 32K Output at (Front Board) pin 80 of uP = 2048Hz
|◄ Button pressed?
Display shows 8M Output at (Front Board) pin 80 of uP = 1,953.125Hz
■ Button pressed?
DISPLAY TEST
DIM Button pressed?
Display shows Fig. 1 and selected LEDs on (see note 1)
DIM Button pressed?
Display shows Fig. 2 and selected LEDs on (see note 2)
■ Button pressed?
VCD TEST
Any (V)CD Buttons pressed?
Choose level by pressing
Various other Tests

LEVEL	DISPLAY MESSAGE		ACTION
	OKAY	ERROR	
1	VER_xxx	-	Where xxx is the MPEG software version
2	DSA_OK	DSA_ER	Check DSA_Data, DSA_Str & DSA_Ack lines
3	SLD_OK	SLD_ER	CDC Sledge Motor test
4	FOC_OK	FOC_ER	Focus Servo Test, a disc is required in Tray 1.
5	RAD_OK	RAD_ER	Radial Servo Test.
6	JMP_OK	JMP_ER	Disc Servo Test - jumping of 16 tracks.
			Press ■ to exit

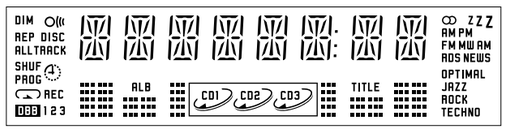
Note: During this test only the standard OSD & Display message are shown on the TV screen.

Note: During Quartz test, the 3CDC tray may "jerks" open, close or the carousel may rotates slightly. This is due to sharing of control lines during the test.

PRESET	Europe "EUR"	East Eur. Extended-band "EAS"	East Eur. "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	530/531kHz*
4	1602kHz	87.5MHz	1602kHz	1700kHz	1700/1602kHz*
5	558kHz	531kHz	558kHz	560kHz	560/558kHz*
6	1494kHz	1602kHz	1494kHz	1500kHz	1500/1494kHz*
7	87.5MHz	558kHz	87.5MHz	98MHz	98/87.5MHz*
8	87.5MHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	87.5MHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	87.5MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	98MHz	65.81MHz	98MHz	87.5MHz	87.5/98MHz*

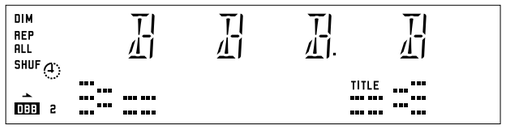
Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.



note 1: JAZZ & TECHNO are on while OPTIMAL is off, other LEDs status are not important (applicable only for sets with LEDs)

Figure 1



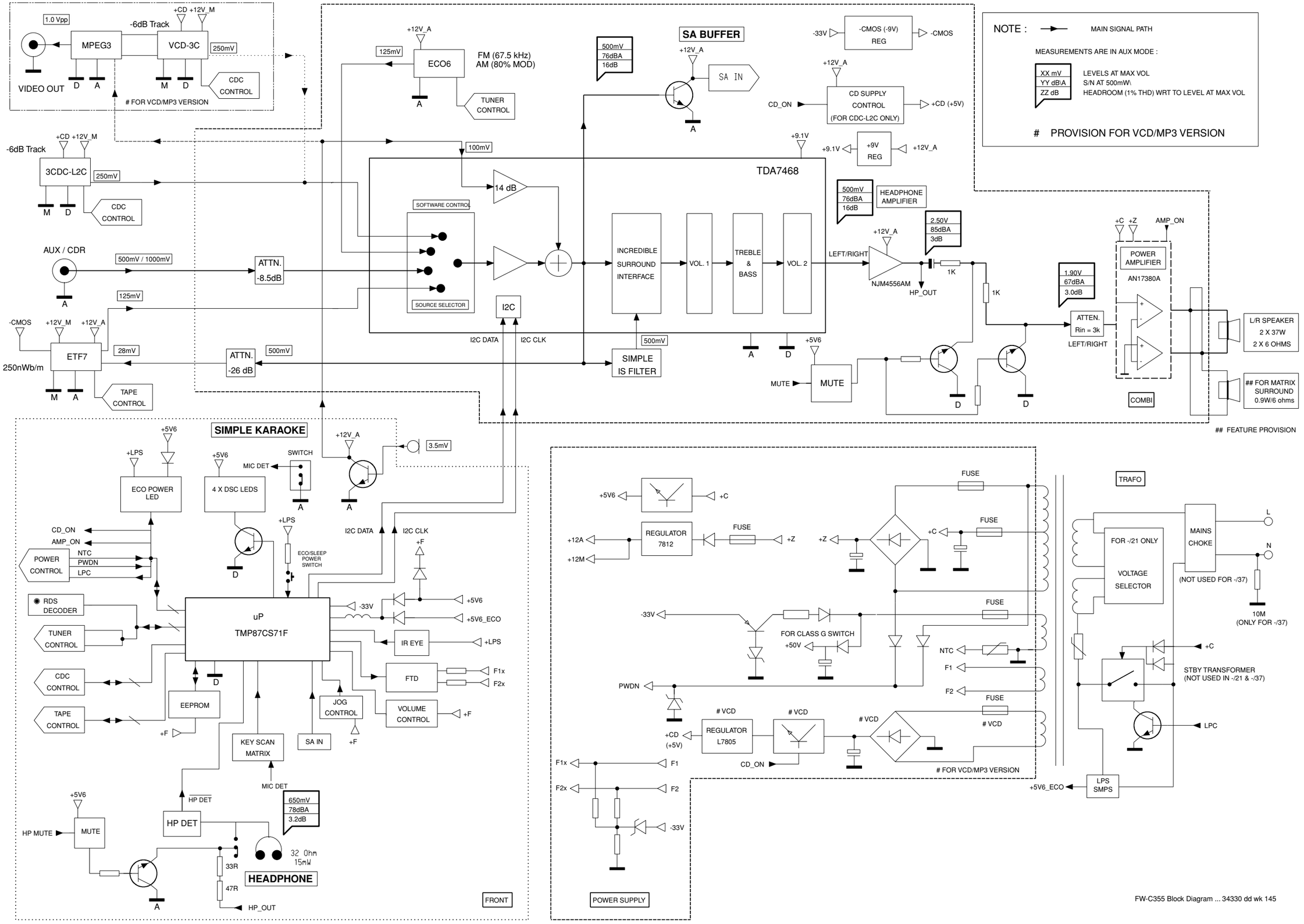
note 2: OPTIMAL is on while JAZZ & TECHNO are off, other LEDs status are not important (applicable only for sets with LEDs)

Figure 2

TEST	*Activated with*	*ACTION*
EEPROM TEST	►► ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT	◄◄	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
ROTARY ENCODER TEST	Volume Knob or Jog Shuttle knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DEMO	DBB	DEMO will toggle on or off. The message: "DEMO ON" or "DEMO OFF" will scroll across the display to show the new status of the set.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

4-1

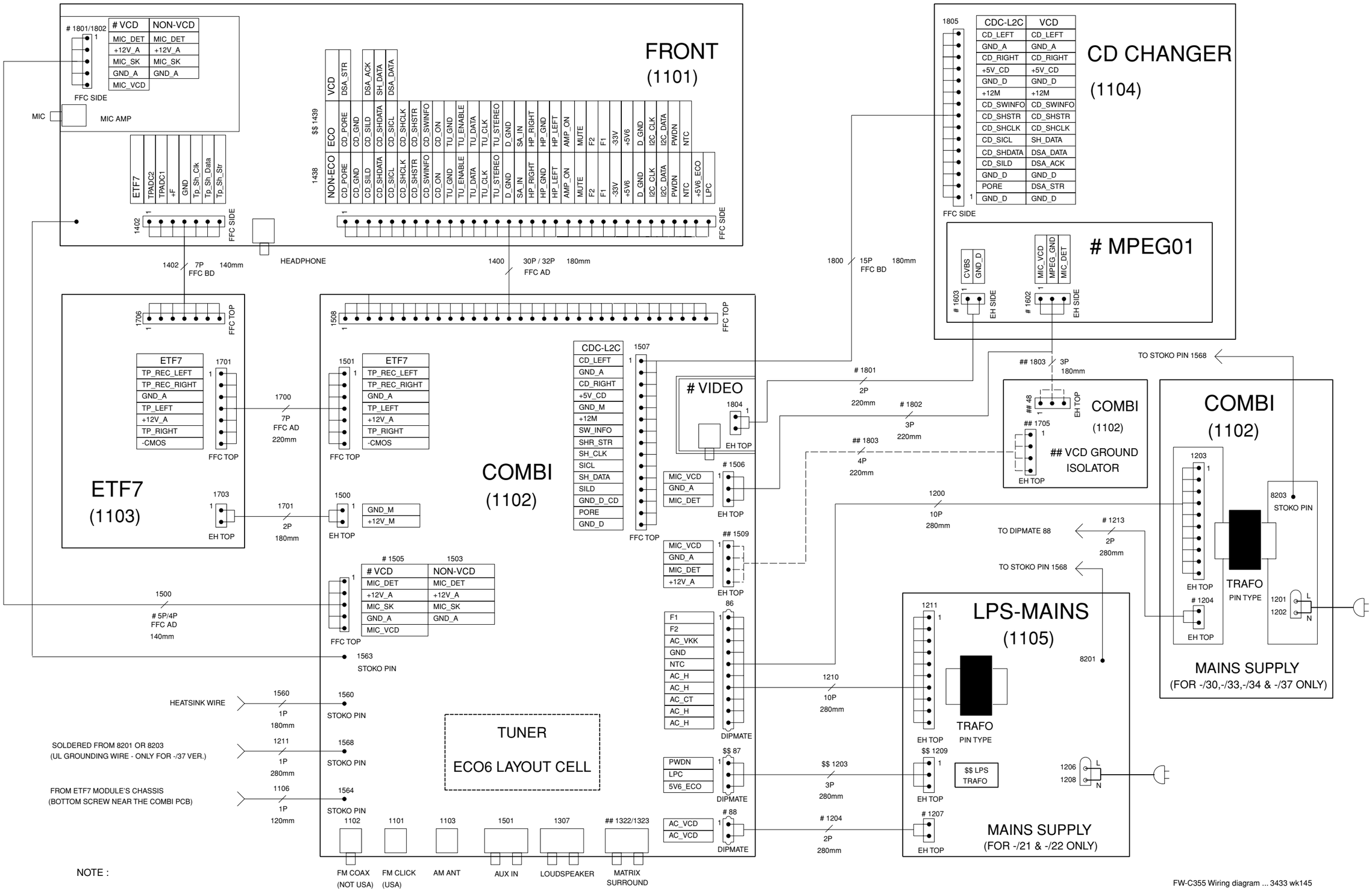
SET BLOCK DIAGRAM



FW-C355 Block Diagram ... 34330 dd wk 145

4-2

SET WIRING DIAGRAM



NOTE :

\# - PROVISION FOR SETS WITH VCD/MP3 FEATURE .
- PROVISION FOR SETS WITH MATRIX SURROUND & VCD GROUND ISOLATOR .
$$ - PROVISION FOR SETS WITH ECO FEATURE (ONLY FOR -/22 VER.) .

MAINS BOARD

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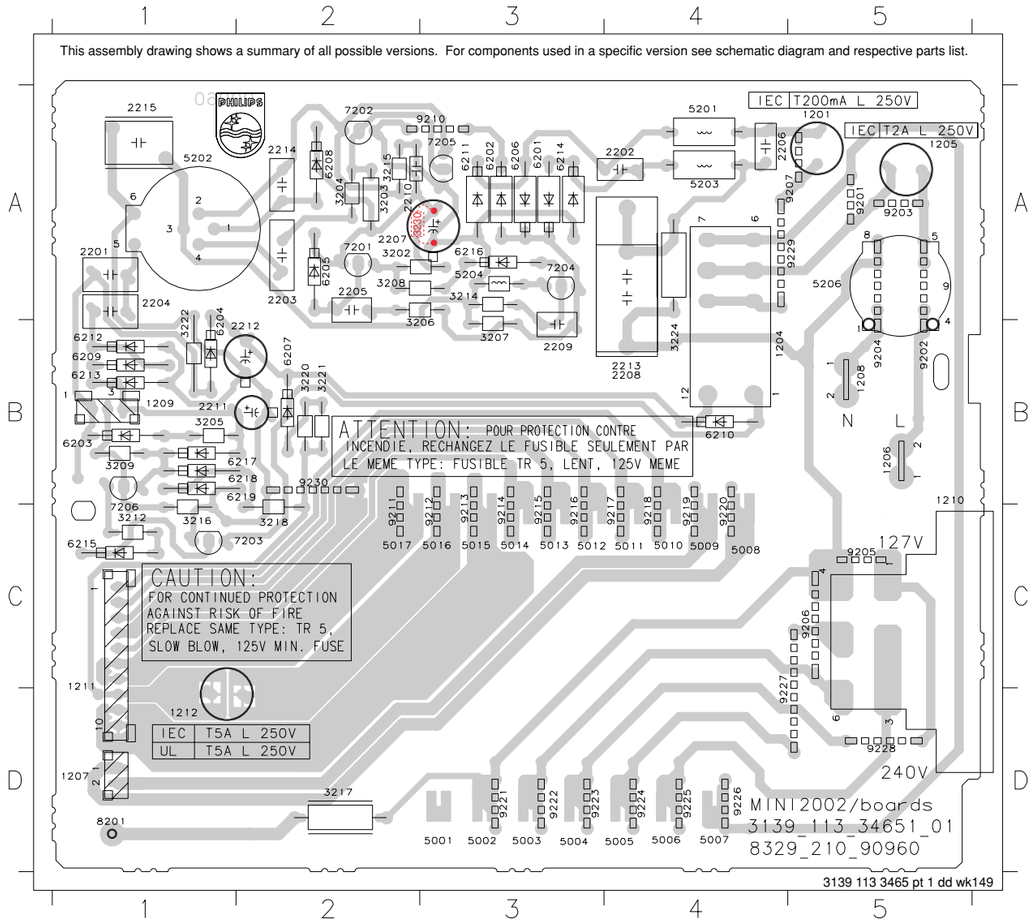
Circuit Diagram 5-2
Electrical parts list 5-3

5-1

COMPONENT LAYOUT

1201	A51211	C12207	A22215	A13209	B13221	B25006	D45014	C35206	A56208	A26216	A37205	A39206	C59216	C39224	D4
1204	B41212	D12208	B43202	A23212	C13222	B15007	D45015	C36201	A36209	B16217	B27206	C19207	A59217	C49225	D4
1205	A52201	A12209	B33203	A23214	A33224	B45008	C45016	C36202	A36210	B46218	B28201	D19210	A39218	C49226	D4
1206	B52202	A42210	A23204	A23215	A25001	D35009	C45017	C26203	B16211	A36219	B29201	A59211	C29219	C49227	D4
1207	D12203	A22211	B13205	B13216	C15002	D35010	C45201	A46204	B16212	B17201	A29202	B59212	C39220	C49228	D5
1208	B52204	A12212	B23206	B23217	D25003	D35011	C45202	A16205	A26213	B17202	A29203	A59213	C39221	D39229	A5
1209	B12205	A22213	B43207	B33218	C25004	D35012	C35203	A46206	A36214	A37203	C29204	B59214	C39222	D39230	B2
1210	B52206	A42214	A23208	A23220	B25005	D45013	C35204	A36207	B26215	C17204	A39205	C59215	C39223	D3	

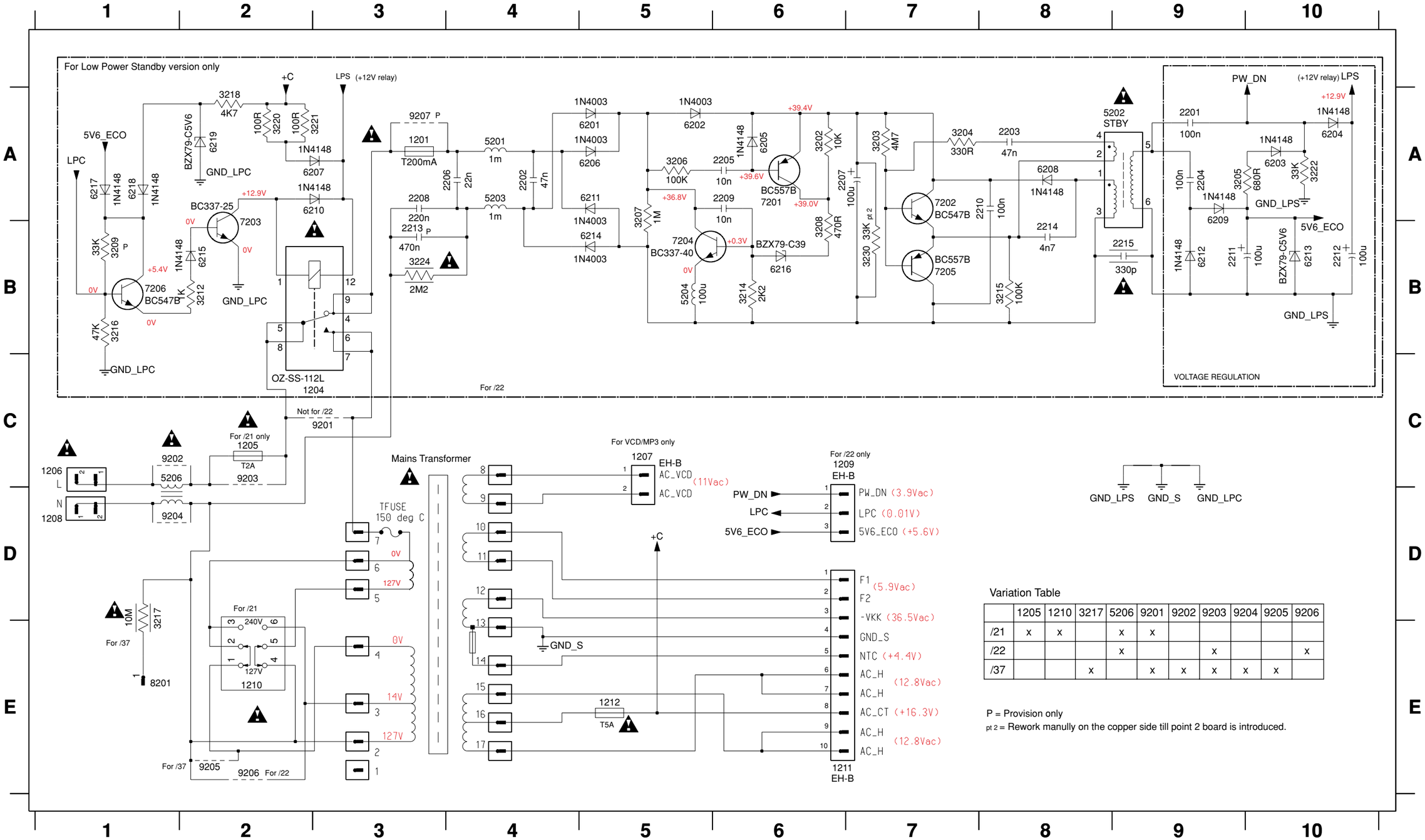

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.
IEC T200mA L 250V
IEC T2A L 250V
ATTENTION: POUR PROTECTION CONTRE INCENDIE, REMPLACEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TR 5, LENT, 125V MEME
CAUTION:
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE SAME TYPE: TR 5, SLOW BLOW, 125V MIN. FUSE
IEC T5A L 250V
UL T5A L 250V
127V
240V
MINI2002/boards
3139_113_34651_01
8329_210_90960
3139 113 3465 pt 1 dd wk149

3230 is soldered manuall on the copper side for pt 1 pcb

5-2

MAINS CIRCUIT

1201 A3 1204 C3 1205 C2 1206 C1 | 1207 C5 1208 D1 1209 C6 1210 E2 | 1211 E6 1212 E5 2201 A9 2202 A4 | 2203 A8 2204 A9 2205 A6 2206 A4 | 2207 A6 2208 A3 2209 A6 2210 A8 | 2211 B9 2212 B10 2213 B3 2214 B8 | 2215 B9 3202 A6 3203 A7 3204 A7 | 3205 A9 3206 A5 3207 A5 3208 B6 | 3209 B1 3212 B2 3214 B6 3215 B8 | 3216 B1 3217 D1 3218 A2 3220 A2 | 3221 A2 3224 B3 3230 B7 | 5201 A4 5202 A8 5203 A4 5204 B5 | 5206 C1 6201 A5 6202 A5 6203 A10 | 6204 A10 6205 A6 6206 A5 6207 A3 | 6208 A8 6209 A9 6210 A3 6211 A5 | 6212 B9 6213 B10 6214 B5 6215 B2 | 6216 B6 6217 A1 6218 A1 6219 A2 | 7201 A6 7202 A7 7203 B2 7204 B5 | 7205 B7 7206 B1 8201 E1 9201 C3 | 9202 C1 9203 C2 9204 D1 9205 E2 | 9206 E2 9207 A3



Variation Table

	1205	1210	3217	5206	9201	9202	9203	9204	9205	9206
/21	x	x		x	x					
/22				x			x			x
/37			x		x	x	x	x	x	

P = Provision only

pt 2 = Rework manully on the copper side till point 2 board is introduced.

ELECTRICAL PARTS LIST - MAINS BOARD

1205	⚠	994000001885	FUSE RAD T 2A 250V
1210	⚠	994000001043	POWER VOLTAGE SW
1212	⚠	994000002955	FUSE RAD LT 5A 250V
5206	⚠	994000002975	FIL MAINS 400µH

Note: Only these parts mentioned in the list are normal service parts.

FRONT BOARD

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Circuit Diagram - Microprocessor part 6-4
Circuit Diagram - Headphone / Miscellaneous part 6-5
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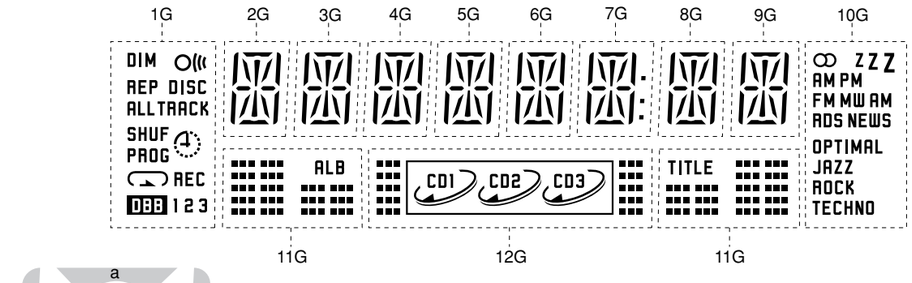
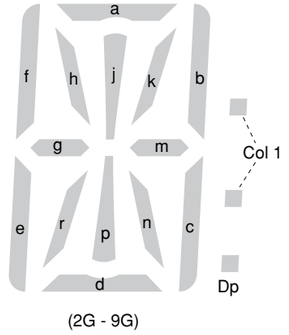
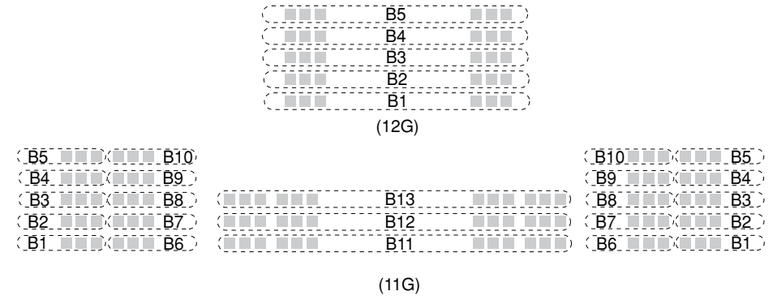
Chip Layout 6-7
Electrical Parts List 6-8

FTD DISPLAY PIN CONNECTIONS





(2G - 9G)



(11G)

	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	B1	B1	∞	a	a	a	a	a	a	a	a	DIM
P2	B2	B2	Z *(Left)*	h	h	h	h	h	h	h	h	
P3	B3	B3	Z *(Middle)*	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	REP
P4	B4	B4	Z *(Right)*	k	k	k	k	k	k	k	k	DISC
P5	B5	B5	AM *(Up)*	b	b	b	b	b	b	b	b	ALL
P6	CD1	B6	PM	f	f	f	f	f	f	f	f	TRACK
P7	CD2	B7	FM	m	m	m	m	m	m	m	m	SHUF
P8	CD3	B8	MW	g	g	g	g	g	g	g	g	PROG
P9	*(1)*	B9	AM *(Low)*	c	c	c	c	c	c	c	c	
P10	*(2)*	B10	RDS	e	e	e	e	e	e	e	e	
P11	*(3)*	B11	NEWS	r	r	r	r	r	r	r	r	
P12		B12	OPTIMAL	n	n	n	n	n	n	n	n	REC
P13	-	B13	JAZZ	d	d	d	d	d	d	d	d	DBB
P14	-	ALB	ROCK	-	-	Col	-	-	-	-	-	1
P15	-	TITLE	TECHNO	-	-	Dp	-	-	-	-	-	2
P16	-	-	-	-	-	-	-	-	-	-	-	3

FTD DISPLAY PIN NO.	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
FUNCTION	F2	-	-	-	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	-	-	-	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	-	-	-	F1

Front Board application

A55470	FW-C355/21/33
A55480	FW-C355/22
A55490	FW-V355/21M, FWV357/98
A55500	FW-C355/34
A55520	FW-M355/22
A55530	FW-M355/34
A55540	FW-M355/37

FEATURES:	A55470	A55480	A55490	A55500	A55520	A55530	A55540			
Karaoke / Mic Detect	x	-	x	-	-	-	-			
VCD	-	-	x	-	-	-	-			
RDS	-	x	-	x	x	x	-			
ECO Power LED	-	x	-	-	x	-	-			

6-2

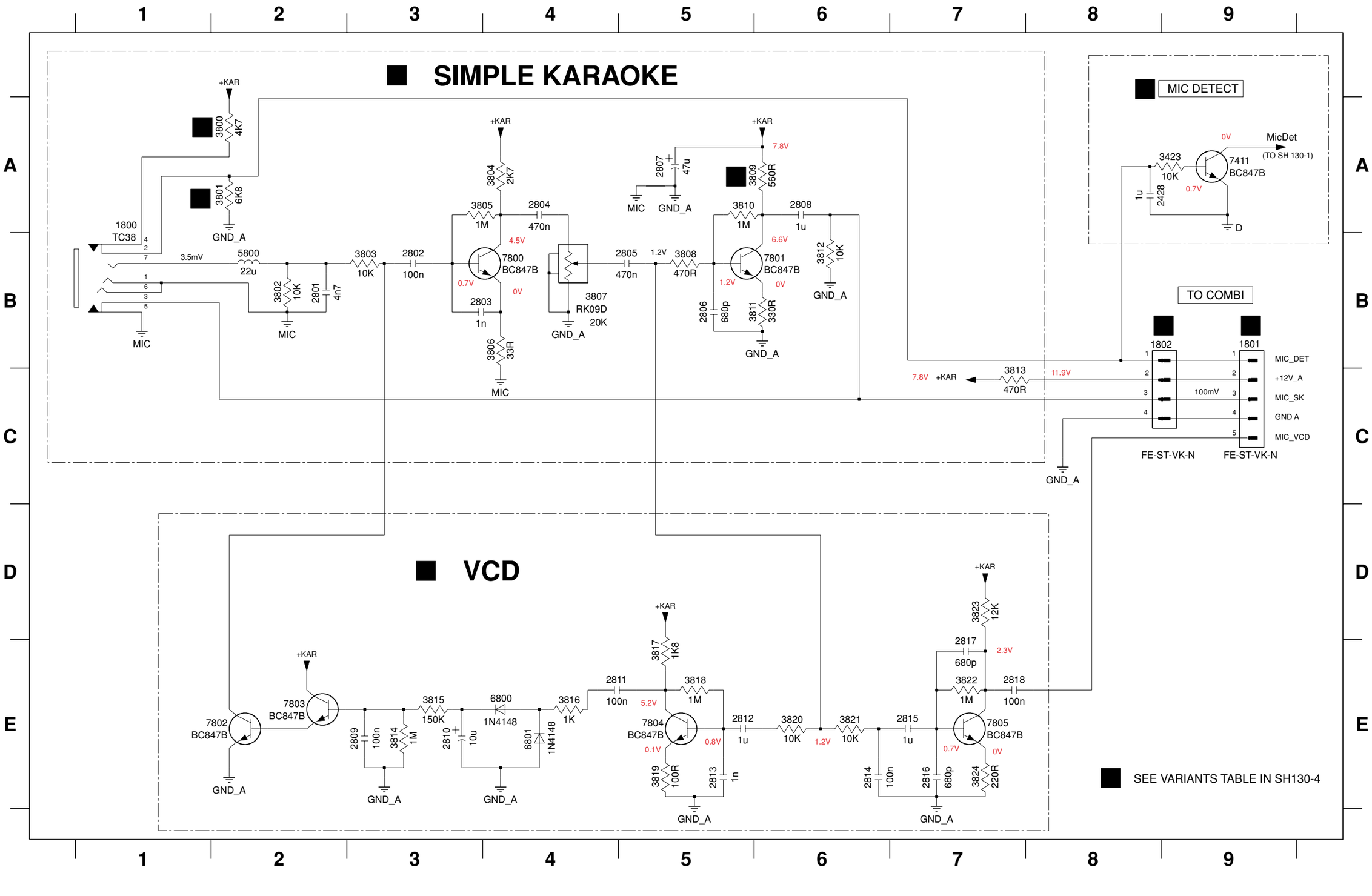
ITEM NO.	A55470	A55480	A55490	A55500	A55520	A55530	A55540	Functions
1427	-	x	x	x	x	x	-	REC
1428	REC	AUTO	AUTO	AUTO	AUTO	AUTO	REC	
1432	AUTO	RDS	PBC	RDS	RDS	RDS	AUTO	
1433	-	NEWS	RETURN	NEWS	NEWS	NEWS	-	
1438	-	x	-	-	x	-	-	with LPC
1439	x	-	x	x	-	x	x	without LPC
1801	-	-	x	-	-	-	-	VCD & KARAOKE
1802	x	-	-	-	-	-	-	KARAOKE
3529	-	330R	330R	330R	330R	330R	-	P01
3546	10k	-	10k	-	-	-	10k	RDSCLK
3548	10k	-	10k	-	-	-	10k	RDSDAT
3549	10k	-	10k	10k	-	10k	10k	RESET
3565	4R7	2R2	4R7	2R2	2R2	2R2	2R2	FTD Filament
3566	-	2R2	-	2R2	2R2	2R2	2R2	FTD Filament
3567	4R7	2R2	4R7	2R2	2R2	2R2	2R2	FTD Filament
3568	-	2R2	-	2R2	2R2	2R2	2R2	FTD Filament
3569	10k	-	10k	10k	-	10k	10k	LPC
3570	-	100k	-	-	100k	-	-	RESET
3800	4k7	-	1k	-	-	-	-	KARAOKE
3801	6k8	-	1k2	-	-	-	-	KARAOKE
3809	560R	-	680R	-	-	-	-	KARAOKE
4408	x	x	-	x	-	-	-	CDSICL
4409	x	-	x	x	-	x	x	+5V6
4410	-	-	x	-	x	x	x	SH_DATA
4411	-	x	-	x	x	x	x	HP_GND
4414	x	-	x	x	-	x	x	DLPC
4416	x	-	-	-	-	-	x	# AUTO
4417	-	x	x	x	x	x	-	AUTO
4419	x	-	x	x	-	x	x	RESET
4459	-	x	-	-	x	-	-	+5V6_ECO
4490	x	-	x	x	-	x	x	+5V6
4491	x	-	-	-	-	-	x	# REC
6401	-	x	-	-	x	-	-	+5V6_ECO
6417	-	x	x	x	x	-	-	P01
6429	x	-	x	-	-	-	-	KARAOKE
6430	-	x	-	-	x	-	-	ECO Power
9401	x	-	x	-	-	-	-	FTD Filament
9402	x	-	x	-	-	-	-	FTD Filament
9410	-	-	x	-	x	x	x	DSA_DATA
9411	-	x	-	-	x	-	-	+LPS
9416	x	x	-	x	-	-	-	CDSHDATA
9488	-	x	-	-	x	-	-	LPC
9506	-	x	-	-	x	-	-	+5V6_ECO
9514	-	x	-	-	x	-	-	+5V6_ECO

x = Item in use.

6-3

CIRCUIT DIAGRAM - KARAOKE PART

1800 A1	2428 A8	2803 B3	2806 B5	2809 E3	2812 E5	2815 E7	2818 E7	3801 A2	3804 A4	3807 B4	3810 A5	3813 C7	3816 E4	3819 E5	3822 E7	5800 B2	7411 A9	7802 E2	7805 E7
1801 B9	2801 B2	2804 A4	2807 A5	2810 E3	2813 E5	2816 E7	3423 A9	3802 B2	3805 A3	3808 B5	3811 B6	3814 E3	3817 E5	3820 E6	3823 D7	6800 E4	7800 B4	7803 E2	
1802 B8	2802 B3	2805 B5	2808 A6	2811 E4	2814 E6	2817 E7	3800 A2	3803 B3	3806 B4	3809 A6	3812 B6	3815 E3	3818 E5	3821 E6	3824 E7	6801 E4	7801 B6	7804 E5	



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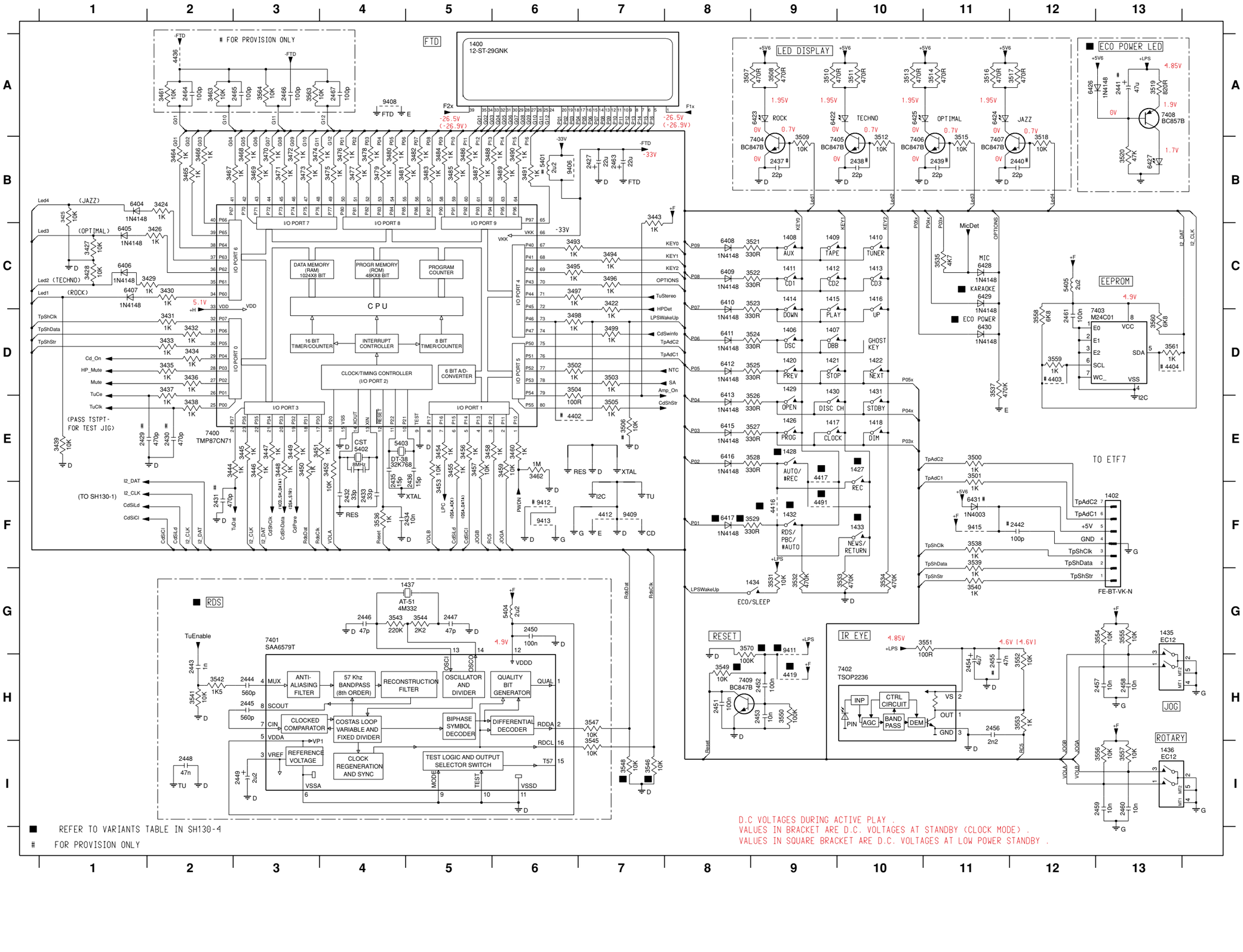
CIRCUIT DIAGRAM - MICROPROCESSOR PART

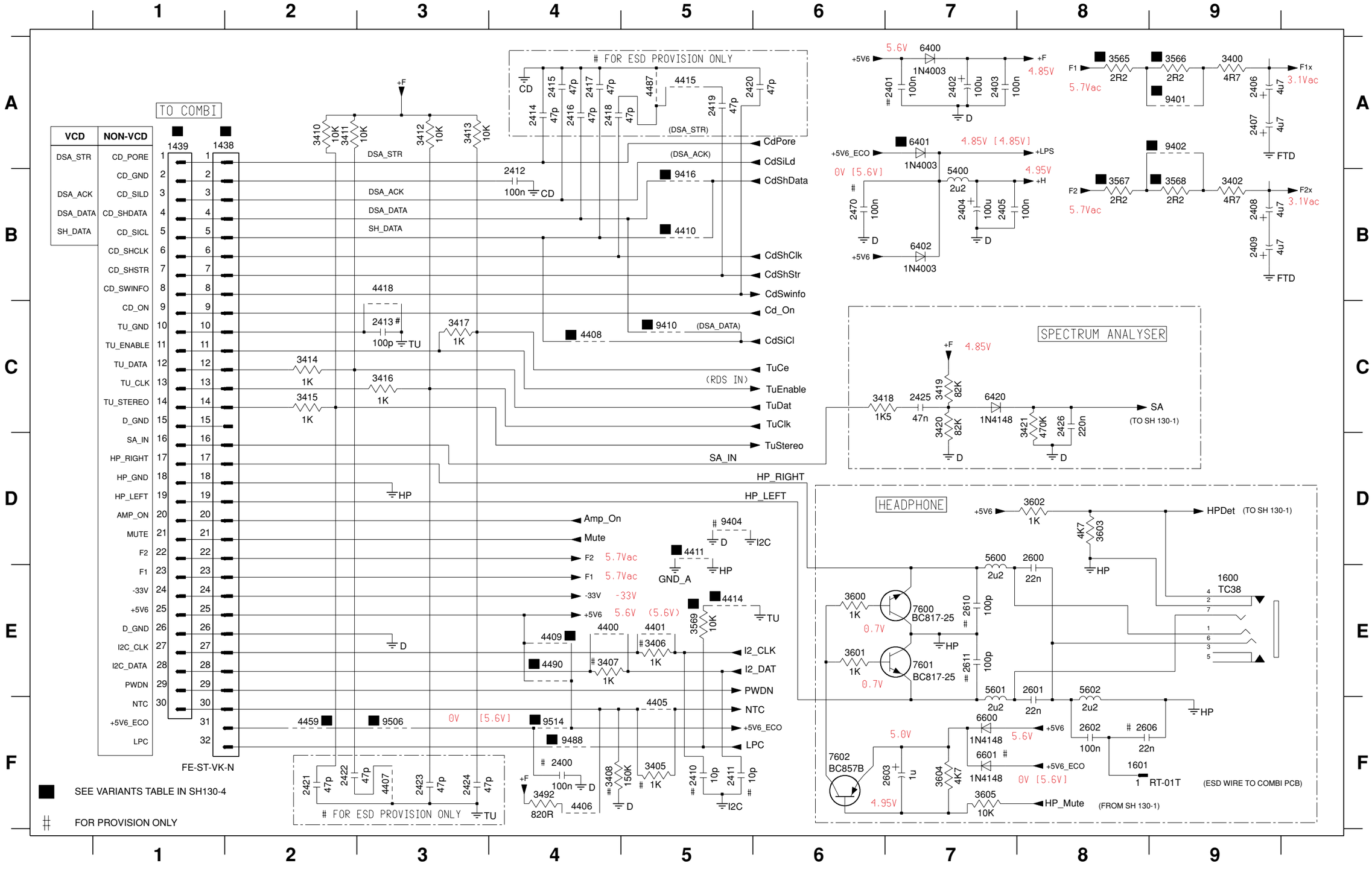


1400 A5	3472 B3	6415 E8
1402 F13	3473 B3	6416 E8
1406 D9	3474 B3	6417 F8
1407 D9	3475 B4	6422 A9
1408 C9	3476 B4	6423 A9
1409 C9	3477 B4	6424 A11
1410 C10	3478 B4	6425 A10
1411 C9	3479 B4	6426 A12
1412 C9	3480 B4	6427 B13
1413 C10	3481 B4	6428 C11
1414 C9	3482 B5	6429 C11
1415 C9	3483 B5	6430 D11
1416 C10	3484 B5	6431 F11
1417 E9	3485 B5	7402 H10
1418 E10	3486 B5	7403 D12
1420 D9	3487 B5	7404 B9
1421 D9	3488 B5	7405 B10
1422 D10	3489 B6	7406 B11
1426 E9	3490 B6	7407 B11
1427 E10	3491 B6	7408 A13
1428 E9	3493 C6	7409 H9
1429 D9	3494 C7	9406 B6
1430 D9	3495 C6	9408 A4
1431 D10	3496 C7	9409 F7
1432 F9	3497 C6	9411 G9
1433 F10	3498 D6	9412 F6
1434 G9	3499 D7	9413 F6
1435 G13	3500 E11	9415 F11
1436 I13	3501 E11	
1437 G5	3502 D6	
2427 B7	3503 D7	
2429 E1	3504 D6	
2430 E2	3505 E7	
2431 F2	3506 E7	
2432 F4	3507 A8	
2433 F4	3508 A9	
2434 F4	3509 B9	
2435 E4	3510 A9	
2436 E5	3511 A10	
2437 B9	3512 B10	
2438 B10	3513 A10	
2439 B11	3514 A11	
2440 B12	3515 B11	
2441 A13	3516 A11	
2442 F12	3517 A12	
2443 H2	3518 B12	
2444 H3	3519 A13	
2445 H3	3520 B13	
2446 G4	3521 C9	
2447 G5	3522 C9	
2448 I2	3523 C9	
2449 I3	3524 D9	
2450 G6	3525 D9	
2451 H8	3526 E9	
2452 H9	3527 E9	
2453 H9	3528 E9	
2454 H11	3529 F9	
2455 H11	3531 G9	
2456 H11	3532 G9	
2457 H13	3533 G10	
2458 H13	3534 G10	
2459 I13	3535 C11	
2460 I13	3536 F4	
2461 D12	3537 D11	
2463 B7	3538 F11	
2464 A2	3539 F11	
2465 A3	3540 G11	
2466 A3	3541 H2	
2467 A4	3542 H2	
3422 C7	3543 G4	
3424 B2	3544 G5	
3425 B1	3545 I7	
3426 C2	3546 I7	
3427 C1	3547 H7	
3428 C1	3548 I7	
3429 C2	3549 H8	
3430 C2	3550 H9	
3431 D2	3551 G11	
3432 D2	3552 H12	
3433 D2	3553 H12	
3434 D2	3554 G13	
3435 D2	3555 G13	
3436 D2	3556 I13	
3437 D2	3557 I13	
3438 E2	3558 D12	
3439 E1	3559 D12	
3443 B7	3560 D13	
3444 E2	3561 D13	
3445 E3	3563 A3	
3446 E3	3564 A3	
3447 E3	3570 G8	
3448 E3	4402 E6	
3449 E3	4403 D12	
3450 E3	4404 D13	
3451 E3	4412 F7	
3452 E4	4416 F9	
3453 F5	4417 E9	
3454 E5	4419 H9	
3455 E5	4436 A2	
3456 E5	4491 F9	
3457 E5	5401 B6	
3458 E5	5402 E4	
3459 E6	5403 E4	
3460 E6	5404 G6	
3461 A2	5405 C12	
3462 E6	6404 B1	
3463 A2	6405 C1	
3464 B2	6406 C1	
3465 B2	6407 C1	
3466 B2	6408 C8	
3467 B2	6409 C8	
3468 B3	6410 C8	
3469 B3	6411 D8	
3470 B3	6412 D8	
3471 B3	6413 E8	

6-5

CIRCUIT DIAGRAM - HEADPHONE / MISCELLANEOUS PART

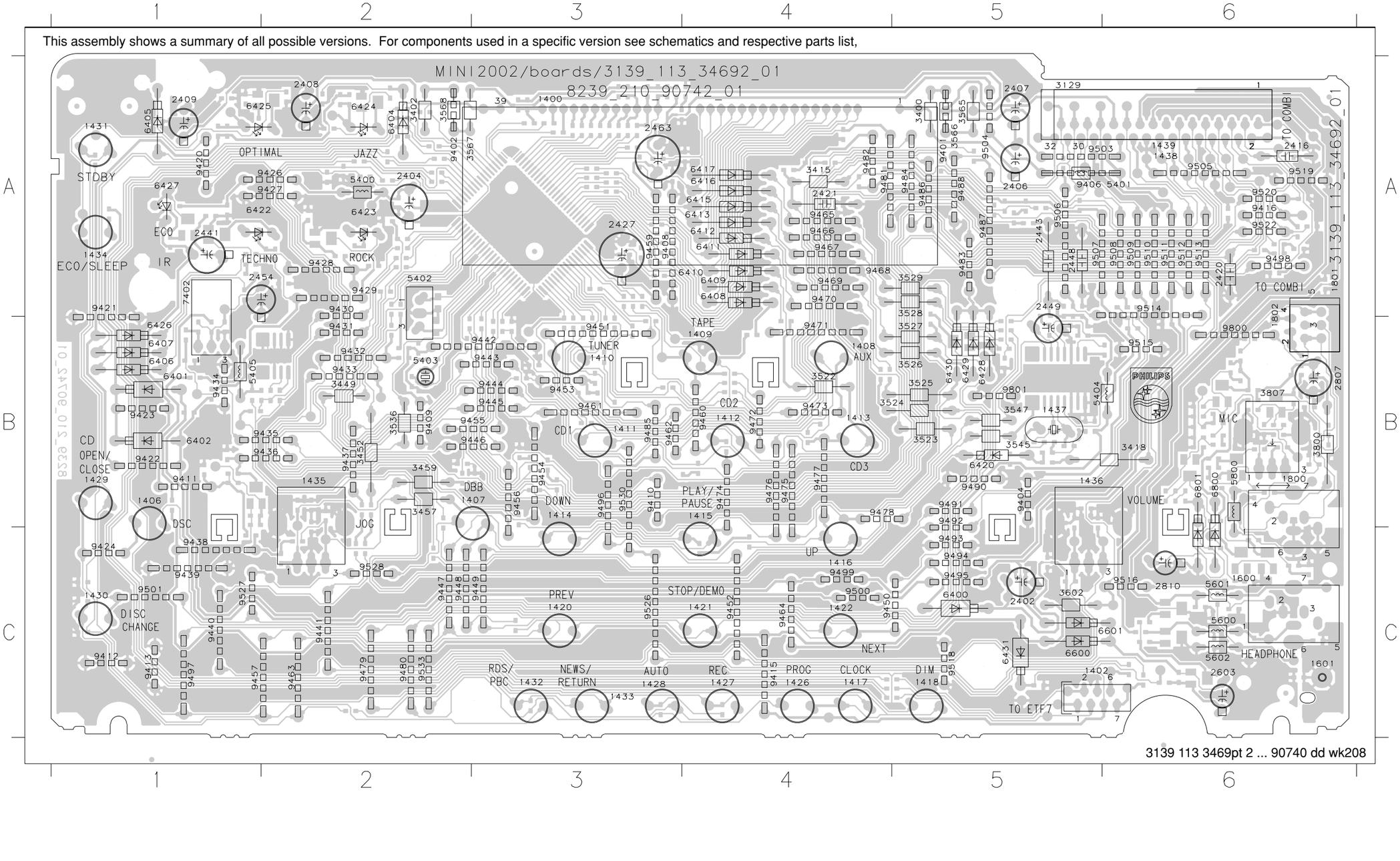
1438 A1 1439 A1 1600 E9 1601 F8 2400 F4 2401 A7 2402 A7 2403 A7 2404 B7 2405 B7 2406 A9 2407 A9 2408 B9 2409 B9 2410 F5 2411 F5 2412 B4 2413 C3 2414 A4 2415 A4 2416 A4 2417 A4 2418 A4 2419 A5 2420 A5 2421 F2 2422 F2 2423 F3 2424 F3 2425 C7 2426 C8 2470 B6 2600 D8 2601 E8 2602 F8 2603 F7 2606 F8 2610 E7 2611 E7 3400 A9 3402 B9 3405 F5 3406 E5 3407 E4 3408 F4 3410 A2 3411 A2 3412 A3 3413 A3 3414 C2 3415 C2 3416 C3 3417 C3 3418 C6 3419 C7 3420 C7 3421 C8 3492 F4 3565 B8 3566 B9 3567 B8 3568 B9 3569 E5 3600 E6 3601 E6 3602 D8 3603 D8 3604 F7 3605 F7 4400 E4 4401 E5 4405 F5 4406 F4 4407 F3 4408 C4 4409 E4 4410 B5 4411 D5 4414 E5 4415 A5 4418 B3 4459 F2 4487 A5 4488 F4 4490 E7 5400 B7 5601 E7 5602 E8 6400 A7 6401 A7 6402 B7 6420 C7 7600 E7 7601 E7 7602 E7 9401 A9 9402 A9 9404 D5 9410 C5 9416 B5 9488 F4 9506 F3 9514 C5 9514 F4



6-6

COMPONENT LAYOUT

1400 A3 1417 C4 1434 A1 2406 A5 2463 A3 3523 B5 3568 A2 5800 B6 6413 A4 6430 B5 9410 B3 9428 A2 9441 C2 9454 B3 9468 A4 9481 A4 9495 C5 9509 A6 9527 C1
1402 C5 1418 C5 1435 B2 2407 A5 2603 C6 3524 B4 3602 C5 6400 C5 6415 A4 6431 C5 9411 B1 9429 A2 9442 B2 9455 B3 9469 A4 9482 A4 9496 B5 9510 A6 9528 C2
1406 B1 1420 C3 1436 B5 2408 A2 2807 B6 3525 B5 3800 B6 6401 B1 6416 A4 6432 C5 9412 C1 9430 A2 9443 B2 9456 B3 9470 A4 9483 A5 9497 C1 9511 A6 9529 B3
1407 B3 1421 C4 1437 B5 2409 A1 2810 C6 3526 B5 3807 B6 6402 B1 6417 A4 6600 C5 9413 C2 9431 A2 9444 B2 9457 C1 9471 B4 9484 A5 9498 A6 9512 A6 9530 C3
1408 B4 1422 C4 1438 A6 2416 A6 3400 A5 3527 B5 5400 A2 6404 A2 6420 B5 6601 C6 9414 C4 9432 B2 9445 B2 9458 C3 9472 B4 9485 B4 9499 C4 9513 A6 9531 C2
1409 B4 1426 C4 1439 A6 2420 A6 3402 A2 3528 B5 5401 A6 6405 A1 6422 A1 6800 B6 9415 C5 9433 B2 9446 B2 9459 C3 9473 B4 9486 B4 9500 C4 9514 A6 9532 C3
1410 B3 1427 C4 1600 C6 2421 A4 3415 A5 3529 A5 5402 A2 6406 B1 6423 A2 6801 B6 9416 A6 9434 B2 9447 B2 9460 C3 9474 B4 9487 B4 9501 C1 9515 B6 9533 C3
1411 B3 1428 C3 1601 C6 2427 A3 3418 B6 3536 B2 5403 B2 6407 B1 6424 A2 7402 A1 9420 A1 9435 B2 9448 B2 9461 B3 9475 B4 9488 B4 9502 A5 9516 C6 9800 B6
1412 B4 1429 B1 1800 B6 2441 A1 3449 B2 3545 B5 5404 B5 6408 A4 6425 A1 9401 A5 9421 A1 9436 B2 9449 B2 9462 B3 9476 B4 9489 B4 9503 A5 9517 C6 9801 B6
1413 B4 1430 C1 1801 A6 2443 A5 3452 B2 3547 B5 5405 B5 6409 A4 6426 B1 9402 A2 9422 B1 9437 B2 9450 B2 9463 C3 9477 B4 9490 B4 9504 A5 9518 C6
1414 B3 1431 A1 1802 A6 2448 A5 3457 B2 3565 A5 5600 C6 6410 A4 6427 A1 9404 B5 9423 B1 9438 B2 9451 B2 9464 C3 9478 B4 9491 B4 9505 A6 9519 C6
1415 B4 1432 C3 2402 C5 2449 A5 3459 B2 3566 A5 5601 C6 6411 A4 6428 B5 9406 A5 9424 C1 9439 B2 9452 B2 9465 C3 9479 B4 9492 B4 9506 A6 9520 C6
1416 C4 1433 C3 2404 A2 2454 A1 3522 B4 3567 A2 5602 C6 6412 A4 6429 B5 9409 B2 9427 A2 9440 C1 9453 B3 9467 A4 9480 C2 9494 C5 9508 A6 9526 C3

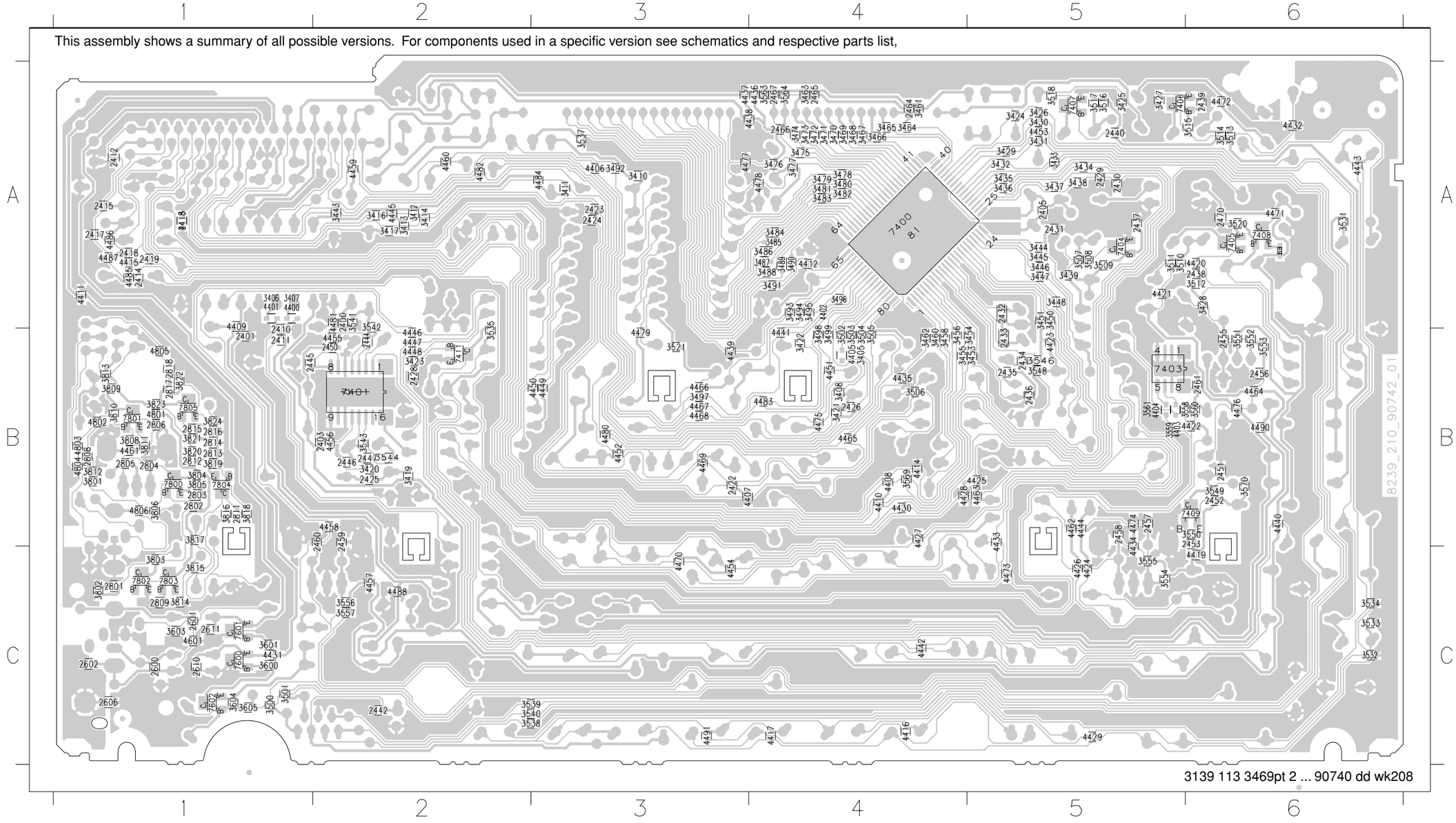


3139 113 3469pt 2 ... 90740 dd wk208

6-7

CHIP LAYOUT

2400	A2	2429	A5	2452	B6	2611	C1	3407	A1	3429	A5	3453	B5	3474	A4	3493	A4	3512	A6	3541	A2	3563	A4	3812	B1	4406	A3	4426	C5	4445	A2	4464	B6	4483	B4	7405	A6
2401	B1	2430	A5	2453	B6	2801	C1	3408	B4	3430	A5	3454	B5	3475	A4	3494	A4	3513	A6	3542	A2	3564	A4	3813	B1	4407	B3	4427	B4	4446	B2	4465	B4	4484	A3	7406	A5
2403	B2	2431	A5	2455	B6	2802	B1	3410	A3	3431	A5	3455	B4	3476	A4	3495	A4	3514	A6	3543	B2	3569	B4	3814	C1	4408	B4	4428	B4	4447	B2	4466	B3	4485	A1	7407	A5
2405	A5	2432	A5	2456	B6	2803	B1	3411	A3	3432	A5	3456	B4	3477	A4	3496	A4	3515	A6	3544	B2	3570	B6	3815	C1	4409	A1	4429	C5	4448	B2	4467	B3	4486	A1	7408	A6
2410	B1	2433	B5	2457	B5	2804	B1	3412	A2	3433	A5	3458	B4	3478	A4	3497	B3	3516	A5	3546	B5	3600	C1	3816	B1	4410	B4	4430	B4	4449	B3	4468	B3	4487	A1	7409	B6
2411	B1	2434	B5	2458	B5	2805	B1	3413	A2	3434	A5	3460	B4	3479	A4	3498	B4	3517	A5	3548	B5	3601	C1	3817	B1	4411	A1	4431	C1	4450	B3	4469	B3	4488	C2	7411	B2
2412	A1	2435	B5	2459	B2	2806	B1	3414	A2	3435	A5	3461	A4	3480	A4	3499	B4	3518	A5	3549	B6	3603	C1	3818	B1	4412	A4	4432	A6	4451	B4	4470	C3	4490	B6	7600	C1
2413	A1	2436	B5	2460	B2	2808	B1	3416	A2	3436	A5	3462	B4	3481	A4	3500	C1	3519	A6	3550	B6	3604	C1	3819	B1	4414	B4	4433	B5	4452	B3	4471	A6	4491	C3	7601	C1
2414	A1	2437	A5	2461	B6	2809	C1	3417	A2	3437	A5	3463	A4	3482	A4	3501	C1	3520	A6	3551	B6	3605	C1	3820	B1	4415	A1	4434	B5	4453	A5	4472	A6	4601	C1	7602	C1
2415	A1	2438	A6	2464	A4	2811	B1	3419	B2	3438	A5	3464	A4	3483	A4	3502	B4	3521	B3	3552	B6	3801	B1	3821	B1	4416	C4	4435	B4	4454	C3	4473	C5	4801	B1	7800	B1
2417	A1	2439	A6	2465	A4	2812	B1	3420	B2	3439	A5	3465	A4	3484	A4	3503	B4	3531	A6	3553	B6	3802	C1	3822	B1	4417	C4	4436	A4	4455	B2	4474	B5	4802	B1	7801	B1
2418	A1	2440	A5	2466	A4	2813	B1	3421	B4	3443	A2	3466	A4	3485	A4	3504	B4	3532	C6	3554	C5	3803	C1	3823	B1	4418	A1	4437	A3	4456	B2	4475	B4	4803	B1	7802	C1
2419	A1	2442	C2	2467	A4	2814	B1	3422	B4	3444	A5	3467	A4	3486	A4	3505	B4	3533	C6	3555	C5	3804	B1	3824	B1	4419	C6	4438	A3	4457	C2	4476	B6	4804	B1	7803	C1
2422	B3	2444	B2	2470	A6	2815	B1	3423	B2	3445	A5	3468	A4	3487	A4	3506	B4	3534	C6	3556	C2	3805	B1	4400	A1	4420	A6	4439	B3	4458	B2	4477	A3	4805	B1	7804	B1
2423	A3	2445	B1	2600	C1	2816	B1	3424	A5	3446	A5	3469	A4	3488	A4	3507	A5	3535	B2	3557	C2	3806	B1	4401	A1	4421	A5	4440	B6	4459	A2	4478	A4	4806	B1	7805	B1
2424	A3	2446	B2	2601	C1	2817	B1	3425	A5	3447	A5	3470	A4	3489	A4	3508	A5	3537	A3	3558	B5	3807	B1	4402	A4	4422	B6	4441	B4	4460	A2	4479	B3	7400	A4		
2425	B2	2447	B2	2602	C1	2818	B1	3426	A5	3448	A5	3471	A4	3490	A4	3509	A5	3538	C2	3559	B5	3808	B1	4403	B5	4423	B5	4442	C4	4461	B1	4480	B3	7401	B2		
2426	B4	2450	B2	2606	C1	3405	B4	3427	A5	3450	A5	3472	A4	3491	A3	3510	A5	3539	C2	3560	B6	3809	B1	4404	B5	4424	C5	4443	A6	4462	B5	4481	A2	7403	B5		
2428	B2	2451	B6	2610	C1	3406	A1	3428	A6	3451	A5	3473	A4	3492	A3	3511	A5	3540	C2	3561	B5	3811	B1	4405	B4	4425	B5	4444	B5	4463	B5	4482	A2	7404	A5		



6-8

ELECTRICAL PARTS LIST - FRONT BOARD

1400	996500013637	FTD 12ST046GNK
1406	482227613775	TACT SW
1407	482227613775	TACT SW
1408	482227613775	TACT SW
1409	482227613775	TACT SW
1410	482227613775	TACT SW
1435	994000002961	ROT ENCODER EC12E2460803
1436	994000001854	ROT ENCODER EC12E2460802
1800	994000002962	HEADPHONE D3.5
3807	996500014725	POTM CAR LIN 20K
5400	482215711477	FIXED IND 2.2µH TP=52MM
5402	996500011372	X'TAL 8MHZ
5403	996500011373	X'TAL 32.768KHZ
5405	482215711477	FIXED IND 2.2µH TP=52MM
5600	482215711477	FIXED IND 2.2µH TP=52MM
5601	482215711477	FIXED IND 2.2µH TP=52MM
5602	482215711477	FIXED IND 2.2µH TP=52MM
5800	994000002976	FIXED 22µH TP26mm
6422	994000002306	LED L174A2SET XEL
6423	994000002306	LED L174A2SET XEL
6424	994000002306	LED L174A2SET XEL
6425	994000002306	LED L174A2SET XEL
7400	994000002977	IC TMP87CS71F-3NN8
7402	932215522667	IR RECEIVER TSOP2236ZC1
7403	932213104668	IC M24C01-WMN6TP

Note: Only these parts mentioned in the list are normal service parts.

MPEG-01B MODULE

This chapter shows the MPEG-01B Board, for 3CDC-LC-VCD mechanism & electronics please refer to Chapter 10

**This module is not intended to be repaired on component level.
Circuit Diagram and Printed Circuit Board drawings
are published for orientation only.
In case of defects please replace the entire board.**

The module can be ordered with codenumber “9940 000 02916”.

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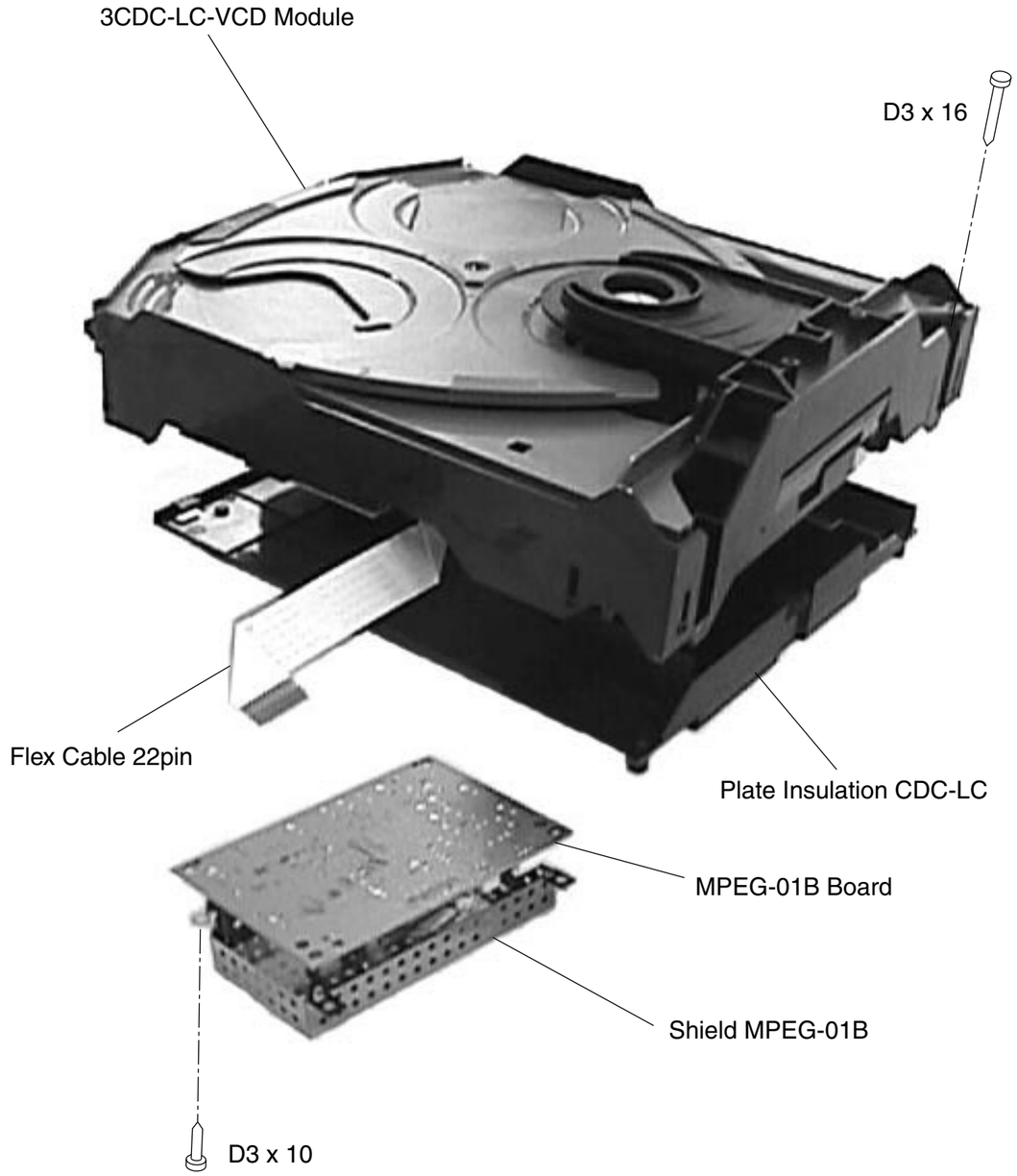
8-1

EXPLODED VIEW OF MODULE



Brief Introduction on the MPEG

1. When VCD source is selected the MPEG_RESET line will go positive triggering the following:
   - DRST pulse to reset 8-bit microcontroller IC 7212
   - RSTOUT# pulse to reset IC 7201 ES3880
   - IC7212 sends CD10_RST to reset Signal Processor IC 7802 on the CD Board.

2. Communication will establish as follows:
   - DSA_ACK, DSA_STB and DSA_DAT between μProcessor IC 7401 on the Front Board and IC 7201 ES3880.
   - DSA_STB to IC7204 ES3883 to select between NTSC (Lo) or PALS (Hi)
   - DSA_A, DSA_D and DSA_S between IC 7201 ES3880 and microcontroller IC7212
   - SILD, SICL, RAB and SDA between microcontroller IC7212 and Signal Processor IC7802 on the CD Board.

3. Other activities between IC7201 ES3880 and Eprom IC7202, Dram IC7203 and IC7204 ES3883 will follows resulting in the OSD display on the TV set connected to the Video out socket.

4. When play button is activated the I^2S signal (IIS_SCLK, IIS_WCLK and IIS_DATA) from the CD Board will enter IC7201 ES3880 which will work closely with the Eprom IC7202 and Dram IC7203. Inverter IC7205 74HC04D serves to reconstruct the Digital signal & level required by IC7201 ES3880.

5. Digital Audio information (AUDIOCLK, AUDATA and BCLK) will be send to DAC (Digital to Analog Converter) of IC7204 ES3883.

6. Analog output (AOL+, AOL-, AOR+ and AOR-) is amplified by the differential Op. Amplifier IC7207 NJM4560M.

7. Digital Video information YUV(0….7) will be send to the Video processing part of IC7204 ES3883 and out to the Video out socket.

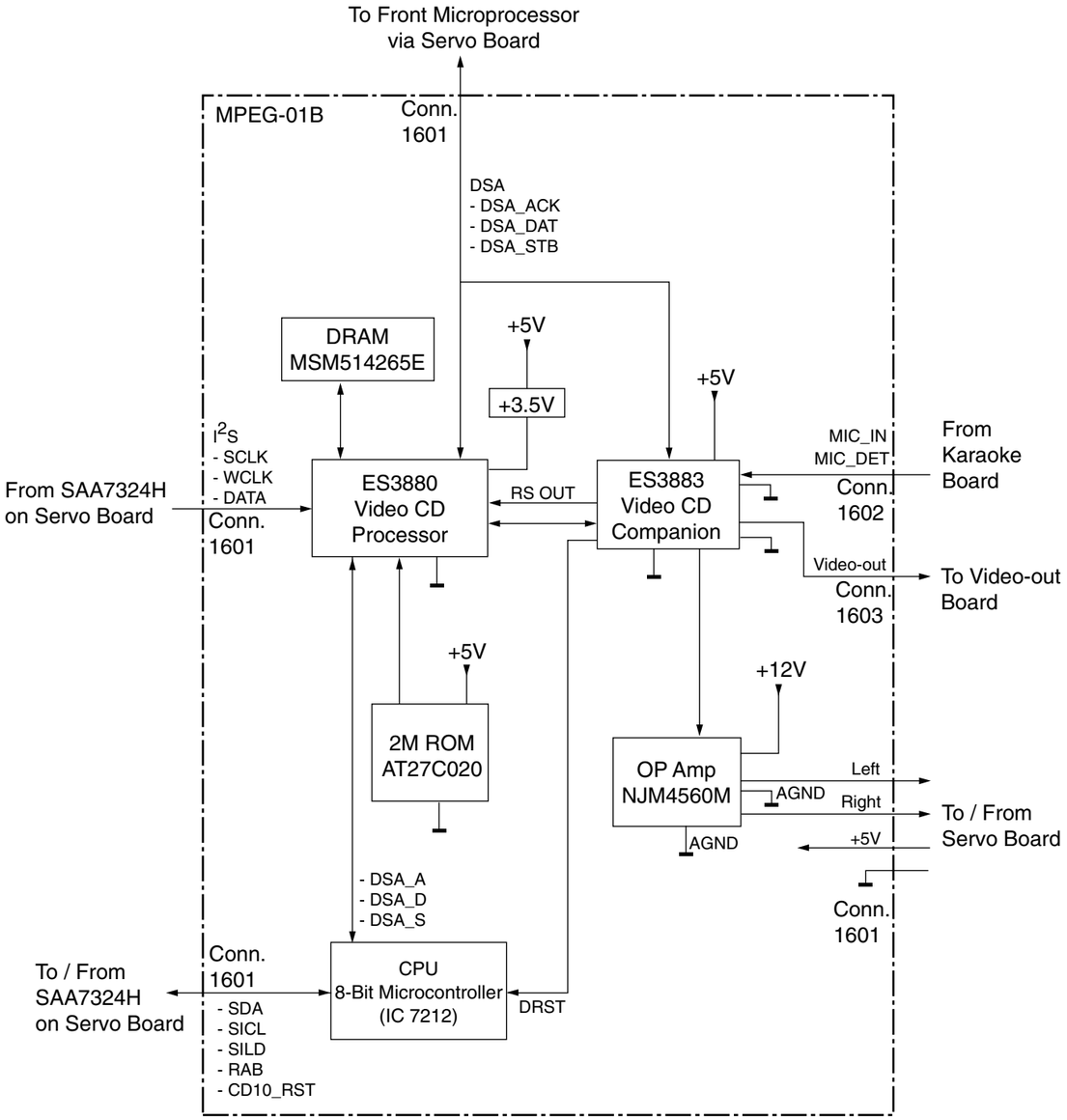
8. The HSYNC & VSYNC from IC7204 ES3883 to IC7201 ES3880 are to synchronize the Digital Video Information.

9. Mic Echo Input into IC7204 ES3883 is converted to digital signal (ARCLK, AIN and ARFS) for IC7201 ES3880 to combine into the Digital Audio Information.

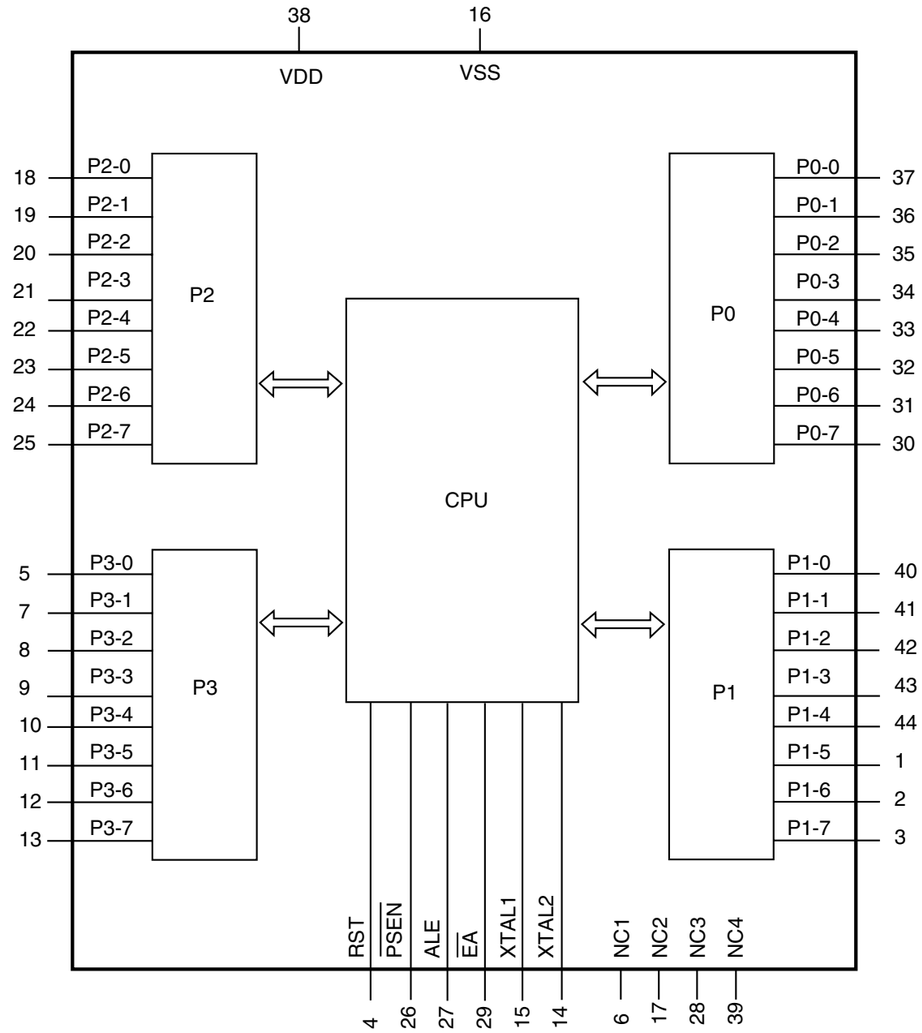
8-2

NOTES:

MPEG-01B BLOCK DIAGRAM

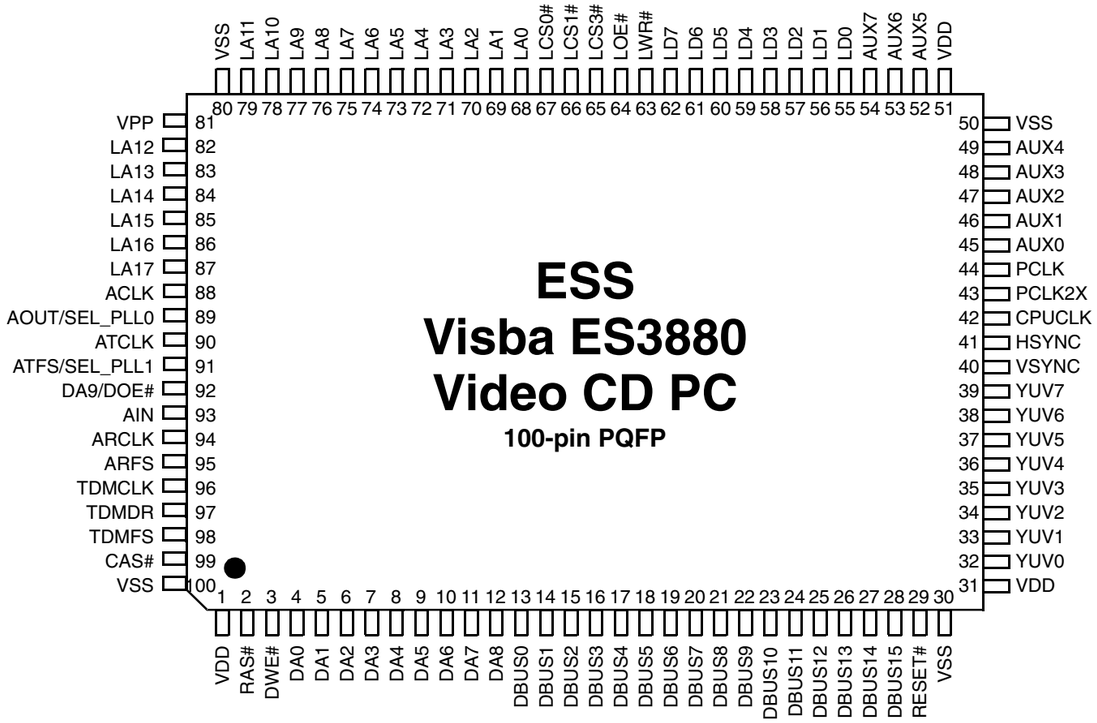


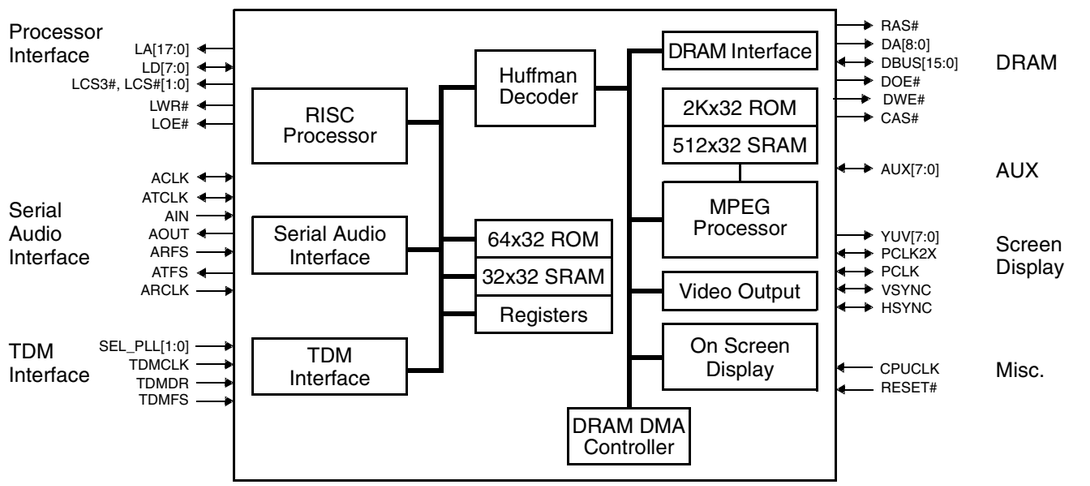
8-BIT MICROCONTROLLER (IC 7212) INTERNAL BLOCK



8-4

ES3880 VIDEO CD PROCESSOR CHIP





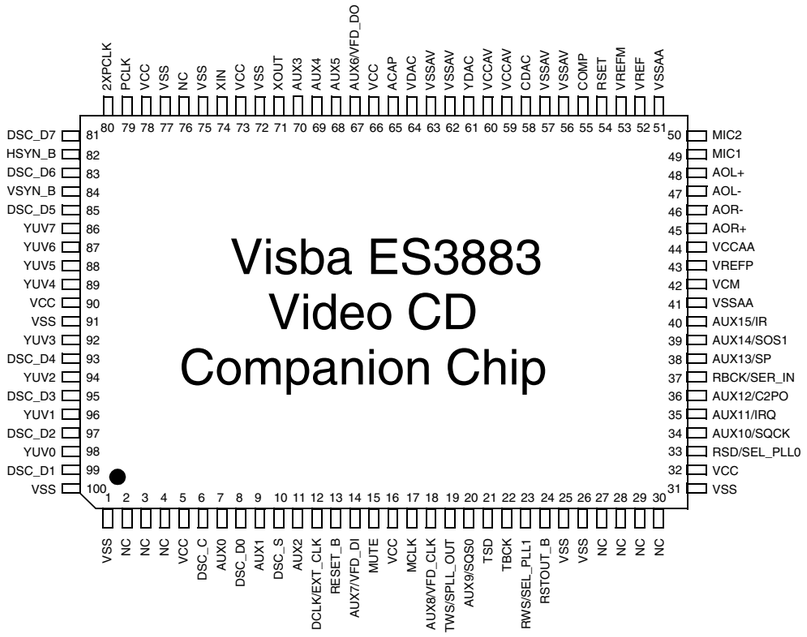
Visba Video CD PC Block Diagram

VISBA VIDEO PC PROCESSOR CHIP PIN DESCRIPTION

Name	Number	I/O	Definition
VDD	1, 31, 51	I	Voltage supply for 3.3 V.
RAS#	2	O	DRAM row address strobe (active low).
DWE#	3	O	DRAM write enable (active low).
DA[8:0]	12:4	O	DRAM multiplexed row and column address bus.
DBUS[15:0]	28:13	I/O	DRAM data bus.
RESET#	29	I	System reset (active low).
VSS	30, 50, 80, 100	I	Ground.
YUV[7:0]	39:32	O	Y is luminance, UV are chrominance data bus for screen video interface. YUV[7:0] for 8-bit YUV mode.
VSYNC	40	I/O	Vertical sync for screen video interface, programmable for rising or falling edge.
HSYNC	41	I/O	Horizontal sync for screen video interface, programmable for rising or falling edge.
CPUCLK	42	I	RISC and system clock input. CPUCLK is used only if SEL_PLL[1:0] = 00.
PCLK2X	43	I/O	Pixel clock; two times the actual pixel clock for screen video interface.
PCLK	44	I/O	Pixel clock qualifier in for screen video interface.
AUX[7:0]	54, 52, 53, 49:45	I/O	Auxiliary control pins (AUX0 and AUX1 are open collectors).
LD[7:0]	62:55	I/O	RISC interface data bus.
LWR#	63	O	RISC interface write enable (active low).
LOE#	64	O	RISC interface output enable (active low).
LCS[3,1,0]#	65,66,67	O	RISC interface chip select (active low).
LA[17:0]	87:82, 79:68	O	RISC interface address bus.
VPP	81	I	Digital supply voltage for 5 V.
ACLK	88	I/O	Master clock for external audio DAC (8.192 MHz, 11.2896 MHz, 12.288 MHz, 16.9344 MHz, and 18.432 MHz).
AOUT/ SEL_PLL0	89	O	Dual-purpose pin. AOUT is the audio interface serial data output
		I	Pins SEL_PLL[1:0] select phase-lock loop (PLL) clock frequency CPUCLK for the Visba: 00 = bypass PLL. 01 = 54 MHz PLL. 10 = 67.5 MHz PLL. 11 = 81 MHz PLL.
ATCLK	90	I/O	Audio transmit bit clock.
ATFS/ SEL_PLL1	91	O	Dual-purpose pin. ATFS is the audio interface transmit frame sync.
		I	Pins SEL_PLL[1:0] select phase-lock loop (PLL) clock frequency CPUCLK for the Visba. See the SEL_PLL0 pin above for the settings.
DA9/DOE#	92	O	Dual purpose pin: DRAM output enable (active low)/DRAM multiplexed row and column address bus.
AIN	93	I	Audio interface serial data input.
ARCLK	94	I	Audio receive bit clock.
ARFS	95	I	Audio interface receive frame sync.
TDMCLK	96	I	TDM interface serial clock.
TDMDR	97	I	TDM interface serial data receive.
TDMFS	98	I	TDM interface frame sync.
CAS#	99	O	DRAM column address strobe bank 0 (active low).

8-5

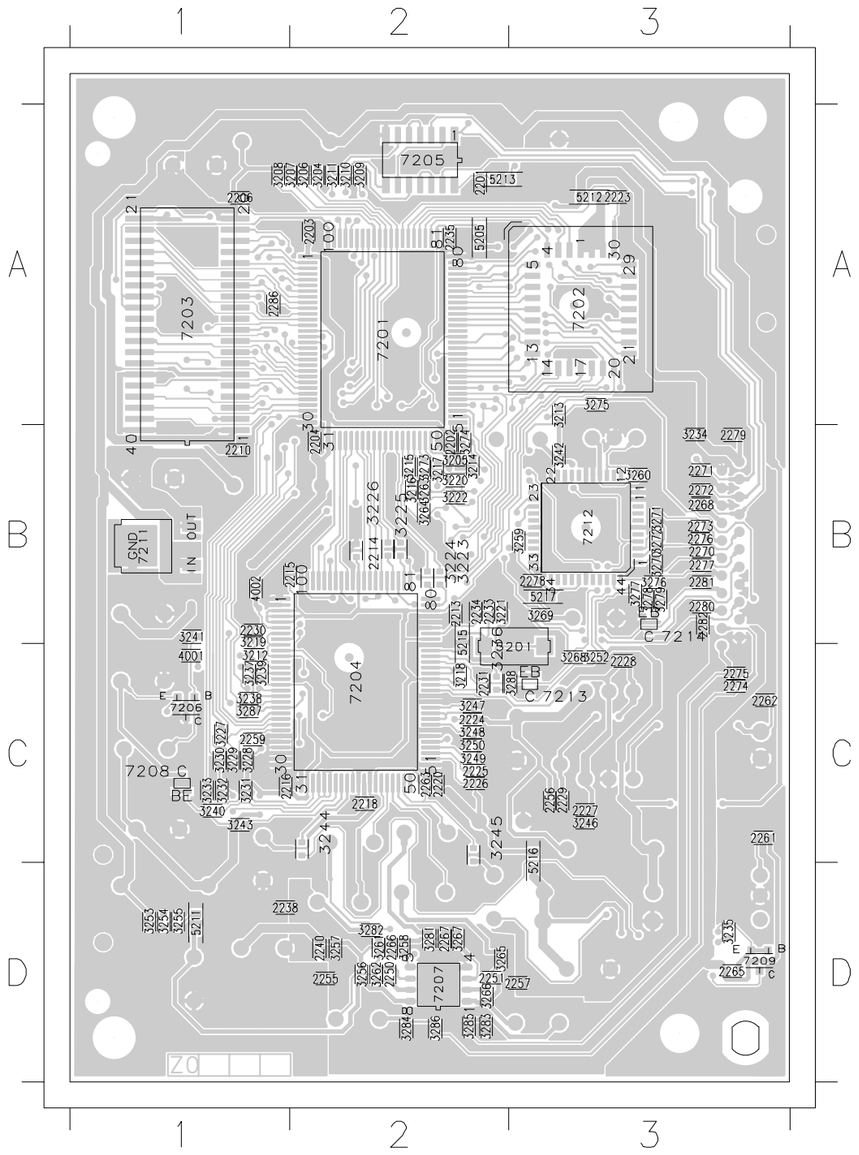
ES3883 VIDEO CD COMPANION CHIP



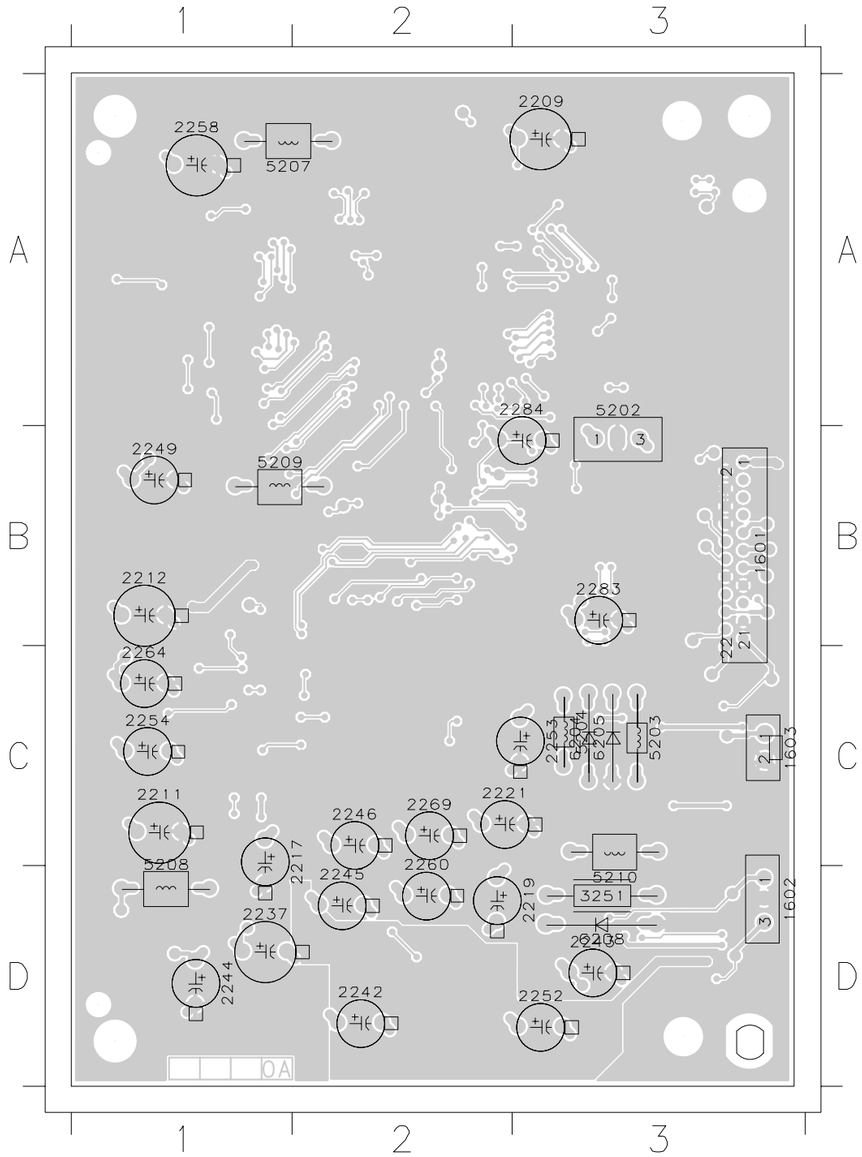
PIN DESCRIPTION

Name	Number	I/O	Definition
VSS	1,25:26,31,72,75,77,91,100	I	Ground.
VCC	5,16,32,66,73,78,90	I	Voltage supply, 5 V.
DSC_C	6	I	Clock for programming to access internal registers.
AUX0	7	I/O	Servo Forward or Control Pin.
AUX1	9	I/O	Servo Reverse or Control Pin.
AUX2	11	I/O	Servo LDON or Control Pin.
AUX3	70	I/O	Servo CW/Limit or Control Pin.
AUX4	69	I/O	Servo CCW/Close or Control Pin.
AUX5	68	I/O	Servo Data or Control Pin.
AUX6	67	I/O	Servo XLAT or Control Pin/VFD_DO.
AUX7	14	I/O	Servo BRKM/Sense or Control Pin/VFD_DI.
AUX8	18	I/O	Servo Mute/Open or Control Pin/VFD_CLK.
AUX9	20	I/O	Servo SQS0 or Control Pin.
AUX10	34	I/O	Servo SQCK or Control Pin.
AUX11	35	I/O	3880 IRQ or Interrupt Output or Control Pin.
AUX12	36	I/O	CD C2PO or Interrupt Input or Control Pin.
AUX13	38	I/O	Serial Interrupt/CD-Mute or Control Pin.
AUX14	39	I/O	Servo SCOR (S0S1) or Interrupt Input or Control Pin.
AUX15	40	I/O	Interrupt Input or Control Pin.
DSC_D[7:0]	81,83,85,93,95,97,99,8	I/O	Data for programming to access internal registers.
DSC_S	10	I	Strobe for programming to access internal registers.
DCLK	12	O	Dual-purpose pin DCLK is the MPEG decoder clock.
EXT_CLK		I	EXT_CLK is the external clock EXT_CLK is an input during bypass PLL mode.
RESET_B	13	I	Video reset (active-low).
MUTE	15	O	Audio mute.
MCLK	17	I	Audio master clock.
TWS	19	I	Dual-purpose pin TWS is the transmit audio frame sync.
SPLL_OUT		O	SPLL_OUT is the select PLL output.
TSD	21	I	Transmit audio data input.
TBCK	22	I	Transmit audio bit clock.
RWS	23	O	Dual-purpose pin RWS is the receive audio frame sync.
SEL_PLL1		I	Pins SEL_PLL[1:0] select the PLL clock frequency for the DCLK output. SEL_PLL1 SEL_PLL0 DCLK 0 0 Bypass PLL (input mode) 0 1 27 MHz (output mode) 1 0 32.4 MHz (output mode) 1 1 40.5 MHz (output mode)
RSTOUT_B	24	O	Reset output (active-low).
NC	2:4,27:30,76		No connect. Do not connect to these pins.
RSD	33	O	Dual-purpose pin. RSD is the receive audio data input.
SEL_PLL0		I	SEL_PLL0 along with SEL_PLL1 select the PLL clock frequency for the DCLK output. See the table for pin number 23.
RBCK	37	O	Dual-purpose pin. RBCK is the receive audio bit clock.
SER_IN		I	SER_IN is the serial input DSC mode. 0 - Parallel DSC mode. 1 - Serial DSC mode.
VSSAA	41,51	I	Audio Analog Ground.
VCM	42	I	ADC Common Mode Reference (CMR) buffer output. CMR is approximately 2.25 V. Bypass to analog ground with 47 mF electrolytic in parallel with 0.1 mF.
VREFP	43	I	DAC and ADC maximum reference. Bypass to VCMR with 10 mF in parallel with 0.1 mF.
VCCAA	44	I	Analog VCC, 5 V.
AOR+, AOR-	45:46	O	Right channel output.
AOL-, AOL+	47:48	O	Left channel output.
MIC1	49	I	Microphone input 1.
MIC2	50	I	Microphone input 2.
VREF	52	I	Internal resistor divider generates Common Mode Reference (CMR) voltage. Bypass to analog ground with 0.1 mF.
VREFM	53	I	DAC and ADC minimum reference. Bypass to VCMR with 10 mF in parallel with 0.1 mF.
RSET	54	I	Full scale DAC current adjustment.
COMP	55	I	Compensation pin.
VSSAV	56:57,62:63	I	Video Analog Ground
CDAC	58	O	Modulated chrominance output.
VCCAV	59,60	I	Video VCC, 5 V
YDAC	61	O	Y luminance data bus for screen video port.
VDAC	64	O	Composite video output.
ACAP	65	I	Audio CAP
XOUT	71	O	Crystal output.
XIN	74	I	27 MHz crystal input.
PCLK	79	I/O	13.5 MHz pixel clock.
2XPCLK	80	I/O	27 MHz (2 times pixel clock).
HSYN_B	82	O	Horizontal sync (active-low).
VSYN_B	84	O	Vertical sync (active-low).
YUV[7:0]	86:89,92,94,96,98	I	YUV data bus for screen video port.

MPEG-01B BOARD LAYOUT



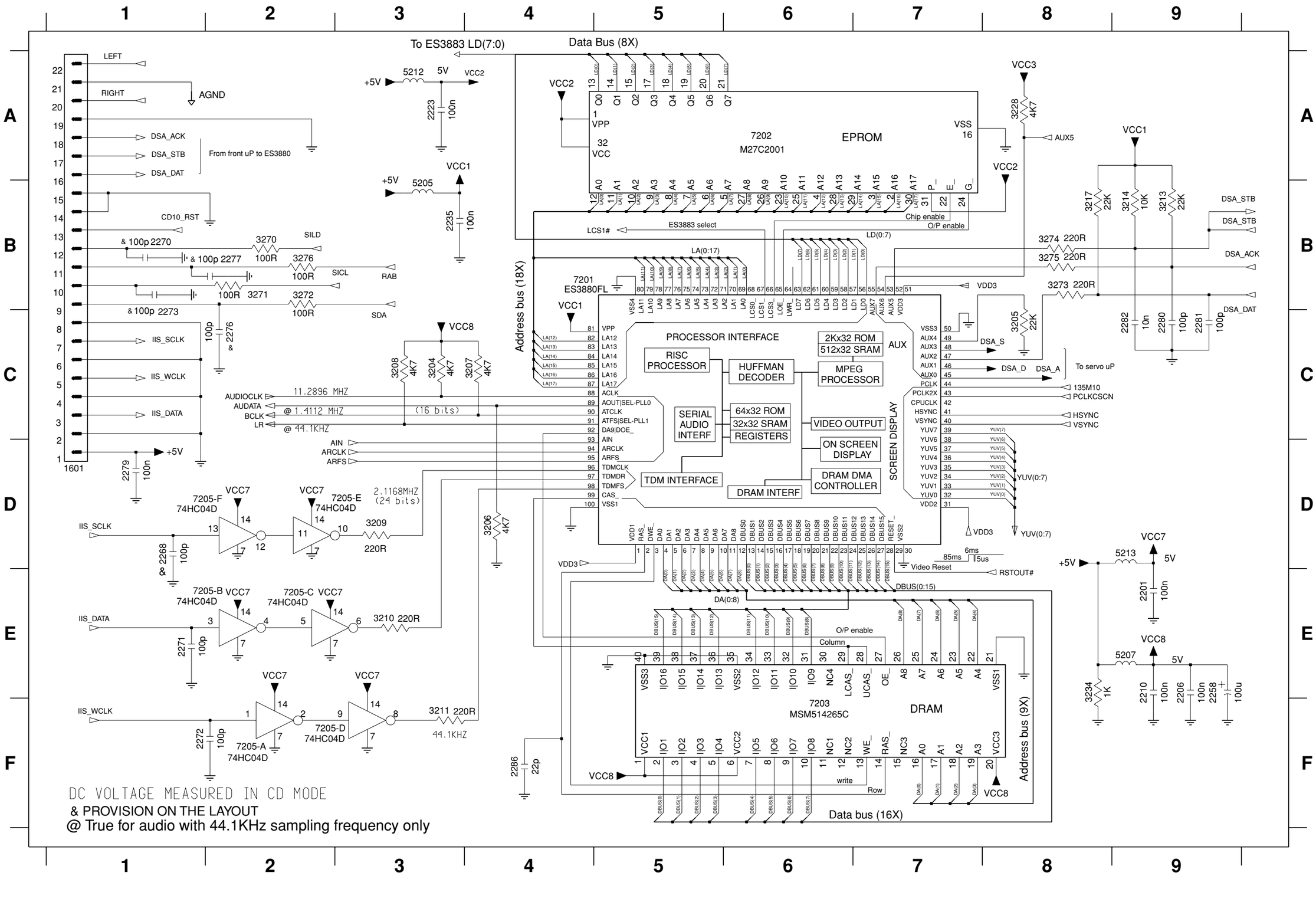
2201	A2	3210	A2	3270	B3
2202	B2	3211	A2	3271	B3
2203	A2	3212	C1	3272	B3
2204	B2	3213	A3	3273	B2
2206	A1	3214	B2	3274	B2
2210	B1	3215	B2	3275	A3
2213	B2	3216	B2	3276	B3
2214	B2	3217	B2	3277	B3
2215	B2	3218	C2	3278	B3
2216	C1	3219	B1	3279	B3
2218	C2	3220	B2	3281	D2
2220	C2	3221	B2	3282	D2
2223	A3	3222	B2	3283	D2
2224	C2	3223	B2	3284	D2
2225	C2	3224	B2	3285	D2
2226	C2	3225	B2	3286	D2
2227	C3	3226	B2	3287	C1
2228	C3	3227	C1	3288	C3
2229	C3	3228	C1	4001	C1
2230	B1	3229	C1	4002	B1
2231	C2	3230	C1	5201	C3
2233	B2	3231	C1	5205	A2
2234	B2	3232	C1	5211	D1
2235	A2	3233	C1	5212	A3
2238	D1	3234	B3	5213	A2
2240	D2	3235	D3	5215	B2
2250	D2	3236	C2	5216	C3
2251	D2	3237	C1	5217	B3
2255	D2	3238	C1	7201	A2
2256	C3	3239	C1	7202	A3
2257	D3	3240	C1	7203	A1
2259	C1	3241	B1	7204	C2
2261	C3	3242	B3	7205	A2
2262	C3	3243	C1	7206	C1
2263	C2	3244	C2	7207	D2
2265	D3	3245	C2	7208	C1
2266	D2	3246	C3	7209	D3
2267	D2	3247	C2	7211	B1
2268	B3	3248	C2	7212	B3
2270	B3	3249	C2	7213	C3
2271	B3	3250	C2	7214	B3
2272	B3	3252	C3		
2273	B3	3253	D1		
2274	C3	3254	D1		
2275	C3	3255	D1		
2276	B3	3256	D2		
2277	B3	3257	D2		
2278	B3	3258	D2		
2279	B3	3259	B3		
2280	B3	3260	B3		
2281	B3	3261	D2		
2282	B3	3262	D2		
2286	A1	3263	B2		
3204	A2	3264	B2		
3205	B2	3265	D2		
3206	A2	3266	D2		
3207	A2	3267	D2		
3208	A1	3268	C3		
3209	A2	3269	B3		



1601	B3				
1602	D3				
1603	C3				
2209	A3				
2211	C1				
2212	B1				
2217	C2				
2219	D3				
2221	C2				
2237	D1				
2242	D2				
2243	D3				
2244	D1				
2245	D2				
2246	C2				
2249	B1				
2252	D3				
2253	C3				
2254	C1				
2258	A1				
2260	C2				
2264	C1				
2269	C2				
2283	B3				
2284	A3				
3251	D3				
5202	A3				
5203	C3				
5204	C3				
5207	A1				
5208	C1				
5209	B1				
5210	D3				
6204	C3				
6205	C3				
6208	D3				

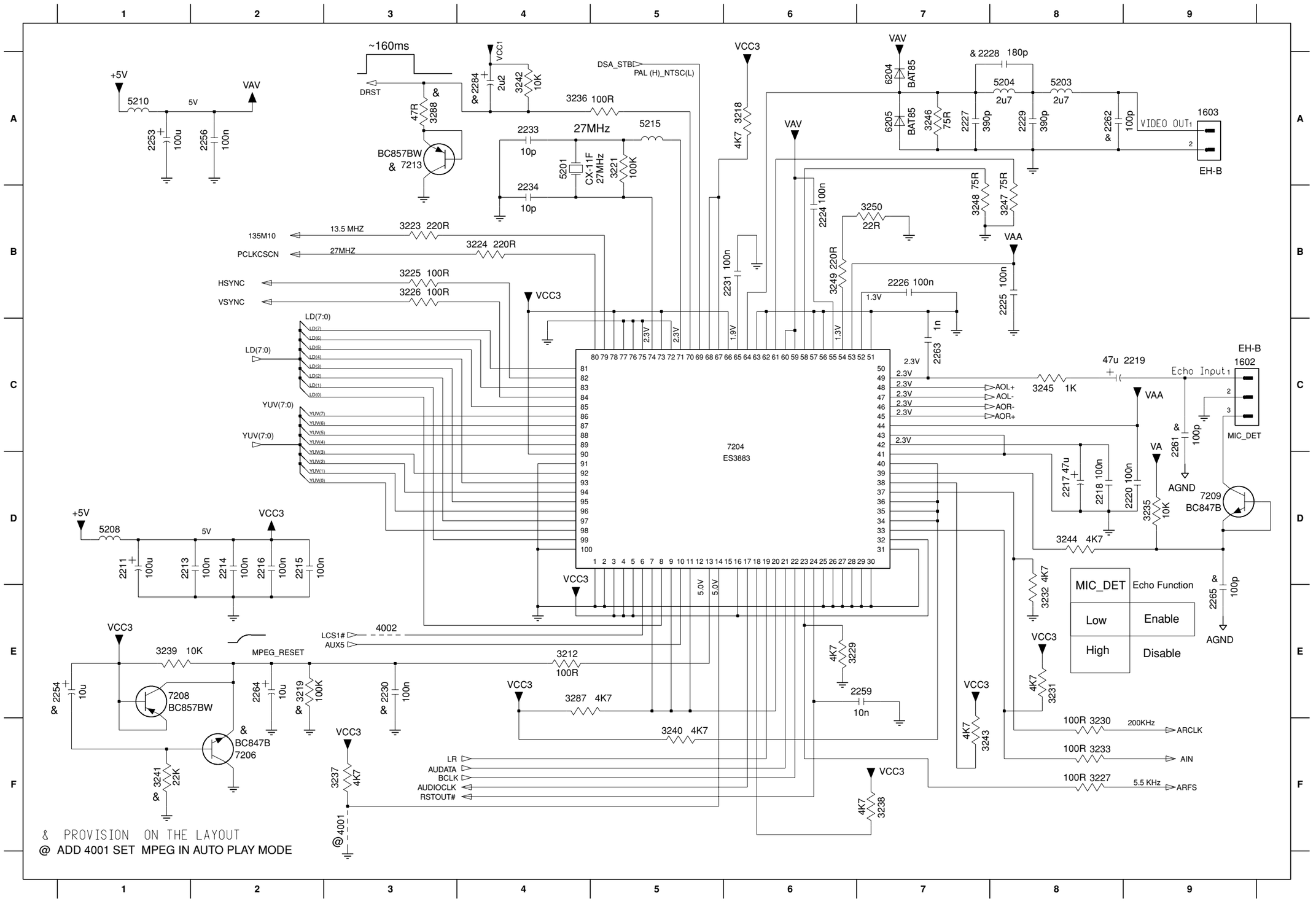
ES3880 CIRCUIT

1601 D1	2210 E9	2258 E9	2271 E1	2276 C2	2280 C9	2286 F4	3206 D4	3209 D3	3213 B9	3228 A8	3271 B2	3274 B8	5205 B3	5213 D9	7203 F6	7205-C E2	7205-F D1
2201 E9	2223 A3	2268 D1	2272 F1	2277 B2	2281 C9	3204 C3	3207 C4	3210 E3	3214 B9	3234 E8	3272 B2	3275 B8	5207 E9	7201 B4	7205-A F2	7205-D F2	
2206 E9	2235 B3	2270 B1	2273 C1	2279 D1	2282 C9	3205 C8	3208 C3	3211 F3	3217 B8	3270 B2	3273 B8	3276 B2	5212 A3	7202 A6	7205-B E1	7205-E D2	

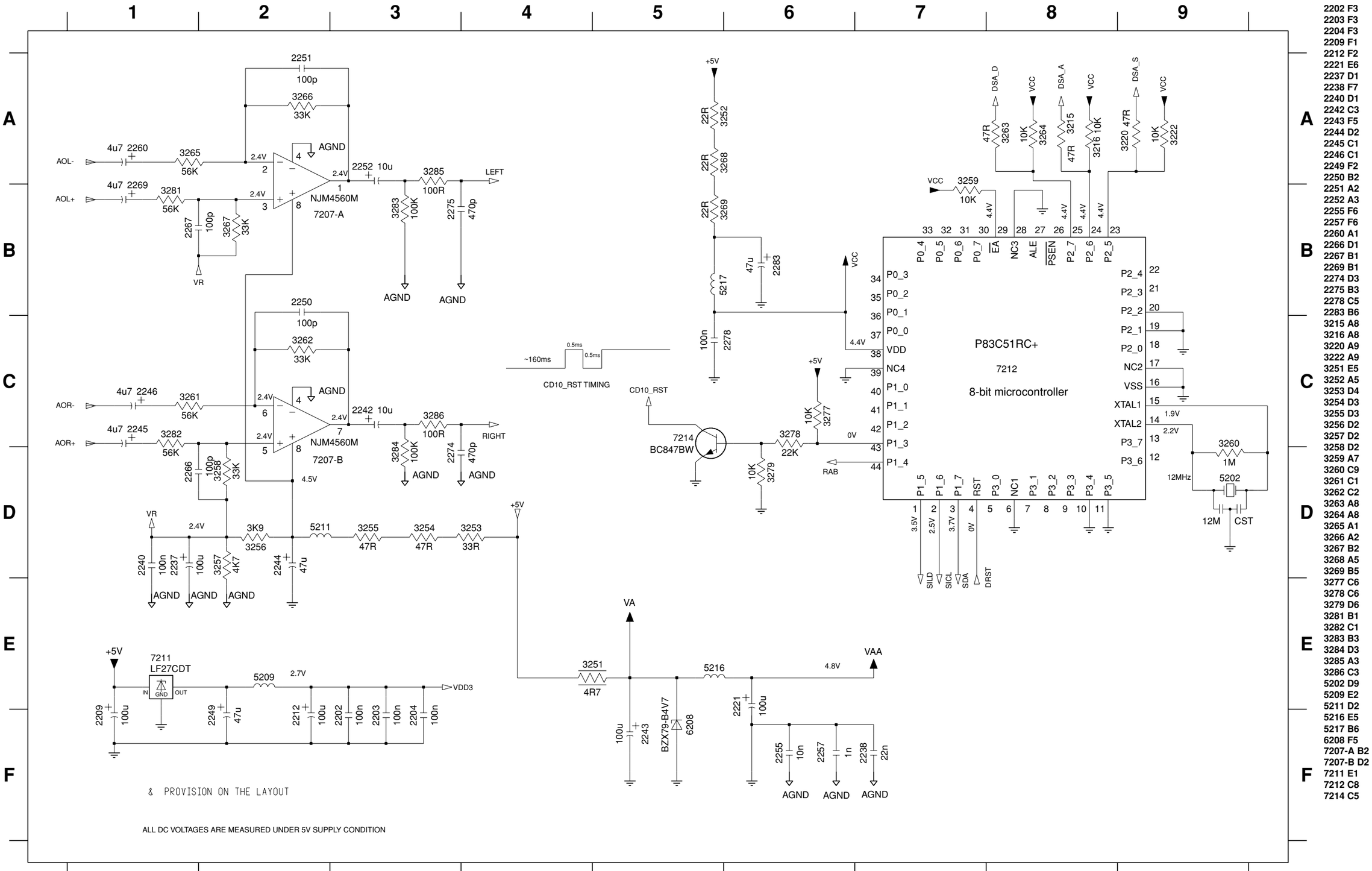


ES3883FL CIRCUIT

1602 C9	2214 D2	2218 D8	2225 B8	2229 A8	2234 B4	2259 E7	2264 E2	3218 A6	3224 B4	3229 E6	3233 F8	3238 F7	3242 A4	3246 A7	3250 B7	4002 E3	5208 D1	6205 A7	7209 D9
1603 A9	2215 D2	2219 C9	2226 B7	2230 E3	2253 A1	2261 C9	2265 E9	3219 E2	3225 B3	3230 F8	3235 D9	3239 E1	3243 F7	3247 B8	3287 E4	5201 A4	5210 A1	7204 C6	7213 A3
2211 D1	2216 D2	2220 D9	2227 A7	2231 B6	2254 E1	2262 A8	2284 A4	3221 A5	3226 B3	3231 E8	3236 A4	3240 F5	3244 D8	3248 B7	3288 A3	5203 A8	5215 A5	7206 F2	
2213 D1	2217 D8	2224 B6	2228 A7	2233 A4	2256 A2	2263 C7	3212 E4	3223 B3	3227 F8	3232 E8	3237 F3	3241 F1	3245 C8	3249 B6	4001 F3	5204 A8	6204 A7	7208 E1	



AUDIO CIRCUIT



2202 F3
2203 F3
2204 F3
2209 F1
2212 F2
2221 E6
2237 D1
2238 F7
2240 D1
2242 C3
2243 F5
2244 D2
2245 C1
2246 C1
2249 F2
2250 B2
2251 A2
2252 A3
2255 F6
2257 F6
2260 A1
2266 D1
2267 B1
2269 B1
2274 D3
2275 B3
2278 C5
2283 B6
3215 A8
3216 A8
3220 A9
3222 A9
3251 E5
3252 A5
3253 D4
3254 D3
3255 D3
3256 D2
3257 D2
3258 D2
3259 A7
3260 C9
3261 C1
3262 C2
3263 A8
3264 A8
3265 A1
3266 A2
3267 B2
3268 A5
3269 B5
3277 C6
3278 C6
3279 D6
3281 B1
3282 C1
3283 B3
3284 D3
3285 A3
3286 C3
5202 D9
5209 E2
5211 D2
5216 E5
5217 B6
6208 F5
7207-A B2
7207-B D2
7211 E1
7212 C8
7214 C5

8-10

ELECTRICAL PARTS LIST - MPEG-01B BOARD

ELECTRICAL PARTS LIST - MPEG-01B BOARD

MISCELLANEOUS

1601	2422 025 16837	Flex Socket 22pin Hort.

CAPACITORS

2201	4822 126 14305	100nF 10% 16V
2202	4822 126 14305	100nF 10% 16V
2203	4822 126 14305	100nF 10% 16V
2204	4822 126 14305	100nF 10% 16V
2206	4822 126 14305	100nF 10% 16V
2209	4822 124 40207	100µF 20% 25V
2210	4822 126 14305	100nF 10% 16V
2211	4822 124 40207	100µF 20% 25V
2212	4822 124 40207	100µF 20% 25V
2213	4822 126 14305	100nF 10% 16V
2214	4822 126 14305	100nF 10% 16V
2215	4822 126 14305	100nF 10% 16V
2216	4822 126 14305	100nF 10% 16V
2217	4822 124 40433	47µF 20% 25V
2218	4822 126 14305	100nF 10% 16V
2219	4822 124 40433	47µF 20% 25V
2220	4822 126 14305	100nF 10% 16V
2221	4822 124 41584	100µF 20% 10V
2223	4822 126 14305	100nF 10% 16V
2224	4822 126 14305	100nF 10% 16V
2225	4822 126 14305	100nF 10% 16V
2226	4822 126 14305	100nF 10% 16V
2227	4822 126 14315	390pF 5% 50V
2229	4822 126 14315	390pF 5% 50V
2231	4822 126 14305	100nF 10% 16V
2233	4822 122 33741	10pF 10% 50V
2234	4822 122 33741	10pF 10% 50V
2235	4822 126 14305	100nF 10% 16V
2237	4822 124 40207	100µF 20% 25V
2238	4822 126 14494	22nF 10% 25V
2240	4822 126 14305	100nF 10% 16V
2242	4822 124 40248	10µF 20% 63V
2243	4822 124 41584	100µF 20% 10V
2244	4822 124 40433	47µF 20% 25V
2245	4822 124 40769	4,7µF 20% 100V
2246	4822 124 40769	4,7µF 20% 100V
2249	4822 124 40433	47µF 20% 25V
2250	2020 522 94427	100pF 50V
2251	2020 522 94427	100pF 50V
2252	4822 124 40248	10µF 20% 63V
2253	4822 124 41584	100µF 20% 10V
2255	5322 126 11583	10nF 10% 50V
2256	4822 126 14305	100nF 10% 16V
2257	3198 016 31020	1nF 5% 25V
2258	4822 124 40207	100µF 20% 25V
2259	5322 126 11583	10nF 10% 50V
2260	4822 124 40769	4,7µF 20% 100V
2263	3198 016 31020	1nF 5% 25V
2264	4822 124 40248	10µF 20% 63V
2266	2020 522 94427	100pF 50V
2267	2020 522 94427	100pF 50V
2269	4822 124 40769	4,7µF 20% 100V
2271	4822 122 31765	100pF 2% 63V
2272	4822 122 31765	100pF 2% 63V
2274	4822 126 13881	470pF 5% 50V
2275	4822 126 13881	470pF 5% 50V
2278	4822 126 14305	100nF 10% 16V
2279	4822 126 14305	100nF 10% 16V
2280	4822 122 31765	100pF 2% 63V
2281	4822 122 31765	100pF 2% 63V
2282	5322 126 11583	10nF 10% 50V
2283	4822 124 40433	47µF 20% 25V
2286	4822 122 33761	22pF 50V NPO 060

RESISTORS

3204	4822 051 30472	4k7 5% 0,062W
3205	4822 051 30223	22k 5% 0,062W
3206	4822 051 30472	4k7 5% 0,062W
3207	4822 051 30472	4k7 5% 0,062W
3208	4822 051 30472	4k7 5% 0,062W
3209	4822 051 30221	220R 5% 0,062W
3210	4822 051 30221	220R 5% 0,062W
3211	4822 051 30221	220R 5% 0,062W
3212	4822 051 30101	100R 5% 0,062W
3213	4822 051 30223	22k 5% 0,062W
3214	4822 051 30103	10k 5% 0,062W
3215	4822 051 30479	47R 5% 0,062W
3216	4822 051 30103	10k 5% 0,062W
3217	4822 051 30223	22k 5% 0,062W
3218	4822 051 30472	4k7 5% 0,062W
3220	4822 051 30479	47R 5% 0,062W
3221	4822 117 13632	100k 1% 0,062W
3222	4822 051 30103	10k 5% 0,062W
3223	4822 051 30221	220R 5% 0,062W
3224	4822 051 30221	220R 5% 0,062W
3225	4822 051 30101	100R 5% 0,062W
3226	4822 051 30101	100R 5% 0,062W
3227	4822 051 30101	100R 5% 0,062W
3228	4822 051 30472	4k7 5% 0,062W
3229	4822 051 30472	4k7 5% 0,062W
3230	4822 051 30101	100R 5% 0,062W
3231	4822 051 30472	4k7 5% 0,062W
3232	4822 051 30472	4k7 5% 0,062W
3233	4822 051 30101	100R 5% 0,062W
3234	4822 051 30102	1k 5% 0,062W
3235	4822 051 30103	10k 5% 0,062W
3236	4822 051 30101	100R 5% 0,062W
3237	4822 051 30472	4k7 5% 0,062W
3238	4822 051 30472	4k7 5% 0,062W
3239	4822 051 30103	10k 5% 0,062W
3240	4822 051 30472	4k7 5% 0,062W
3242	4822 051 30103	10k 5% 0,062W
3243	4822 051 30472	4k7 5% 0,062W
3244	4822 051 30472	4k7 5% 0,062W
3245	4822 051 30102	1k 5% 0,062W
3246	4822 051 30759	75R 5% 0,062W
3247	4822 051 30759	75R 5% 0,062W
3248	4822 051 30759	75R 5% 0,062W
3249	4822 051 30221	220R 5% 0,062W
3250	4822 117 12139	22R 5% 0,062W
3251	4822 052 10478	▲ 4R7 5% 0,33W
3252	4822 117 12139	22R 5% 0,062W
3253	4822 051 30339	33R 5% 0,062W
3254	4822 051 30479	47R 5% 0,062W
3255	4822 051 30479	47R 5% 0,062W
3256	4822 051 30392	3k9 5% 0,062W
3257	4822 051 30472	4k7 5% 0,062W
3258	4822 051 30333	33k 5% 0,1W
3259	4822 051 30103	10k 5% 0,062W
3260	4822 051 30105	1M 5% 0,062W
3261	4822 051 30563	56k 5% 0,1W
3262	4822 051 30333	33k 5% 0,1W
3263	4822 051 30479	47R 5% 0,062W
3264	4822 051 30103	10k 5% 0,062W
3265	4822 051 30563	56k 5% 0,1W
3266	4822 051 30333	33k 5% 0,1W
3267	4822 051 30333	33k 5% 0,1W
3268	4822 117 12139	22R 5% 0,062W
3269	4822 117 12139	22R 5% 0,062W
3270	4822 051 30101	100R 5% 0,062W
3271	4822 051 30101	100R 5% 0,062W
3272	4822 051 30101	100R 5% 0,062W
3273	4822 051 30221	220R 5% 0,062W
3274	4822 051 30221	220R 5% 0,062W
3275	4822 051 30221	220R 5% 0,062W
3276	4822 051 30101	100R 5% 0,062W
3277	4822 051 30103	10k 5% 0,062W
3278	4822 051 30223	22k 5% 0,062W
3279	4822 051 30103	10k 5% 0,062W
3281	4822 051 30563	56k 5% 0,1W
3282	4822 051 30563	56k 5% 0,1W
3283	4822 117 13632	100k 1% 0,062W
3284	4822 117 13632	100k 1% 0,062W
3285	4822 051 30101	100R 5% 0,062W
3286	4822 051 30101	100R 5% 0,062W
3287	4822 051 30472	4k7 5% 0,062W
4002	4822 051 30008	0R Jumper 0603

COILS & FILTERS

5201	2422 543 01137	X'tal Resonator 27MHz
5202	5322 242 73686	Ceram Resonator 12MHz
5203	4822 157 11868	Coil 2,7 H 5%
5204	4822 157 11868	Coil 2,7 H 5%
5205	4822 157 11506	Chip Ind. 120R 100MHz
5207	4822 526 10704	FE Bead 100MHz
5208	4822 526 10704	FE Bead 100MHz
5209	4822 526 10704	FE Bead 100MHz
5210	4822 526 10704	FE Bead 100MHz
5211	4822 157 11506	Chip Ind. 120R 100MHz
5212	4822 157 11506	Chip Ind. 120R 100MHz
5213	4822 157 11506	Chip Ind. 120R 100MHz
5215	4822 157 11506	Chip Ind. 120R 100MHz
5216	4822 157 11506	Chip Ind. 120R 100MHz
5217	4822 157 11506	Chip Ind. 120R 100MHz

DIODES

6204	4822 130 31983	BAT85
6205	4822 130 31983	BAT85
6208	4822 130 34174	BZX79-B4V7

TRANSISTORS & INTEGRATED CIRCUITS

7201	9322 178 33671	ES3880FL
7202	9965 000 08683	AT27C020-70JC
7203	9322 164 13668	MSM514265E-60JS
7204	9322 138 97671	ES3883
7205	9337 142 60653	74HC04D
7207	4822 209 83357	NJM4560M
7208	5322 130 42756	BC857BW
7209	3198 010 42310	BC847BW
7211	9322 178 32668	LF27CDT
7212	9352 701 41518	CV9210B-83C51RC+
7214	3198 010 42310	BC847BW

Note:
Completed MPEG-01module available on service stock.
Code numbers are published for orientation only.

ETF7 TAPE MODULE

(Non-Dolby Version)

This module is not intended to be repaired on component level.
Circuit Diagram and Printed Circuit Board drawings
are published for orientation only.
In case of defects please replace the entire board and mechanism.
The Tape Board can be ordered with codenumber “9940 000 02967”.
The Tape Deck can be ordered with codenumber “9940 000 02927”.

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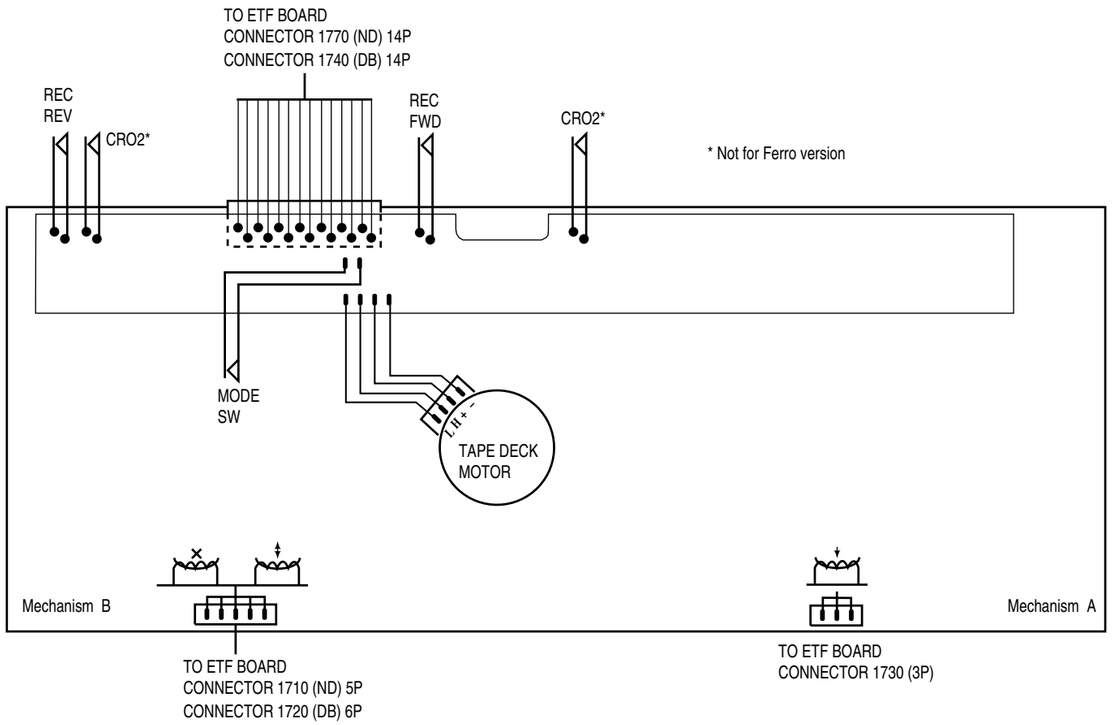
9-1

Tapedeck wiring (Double deck)



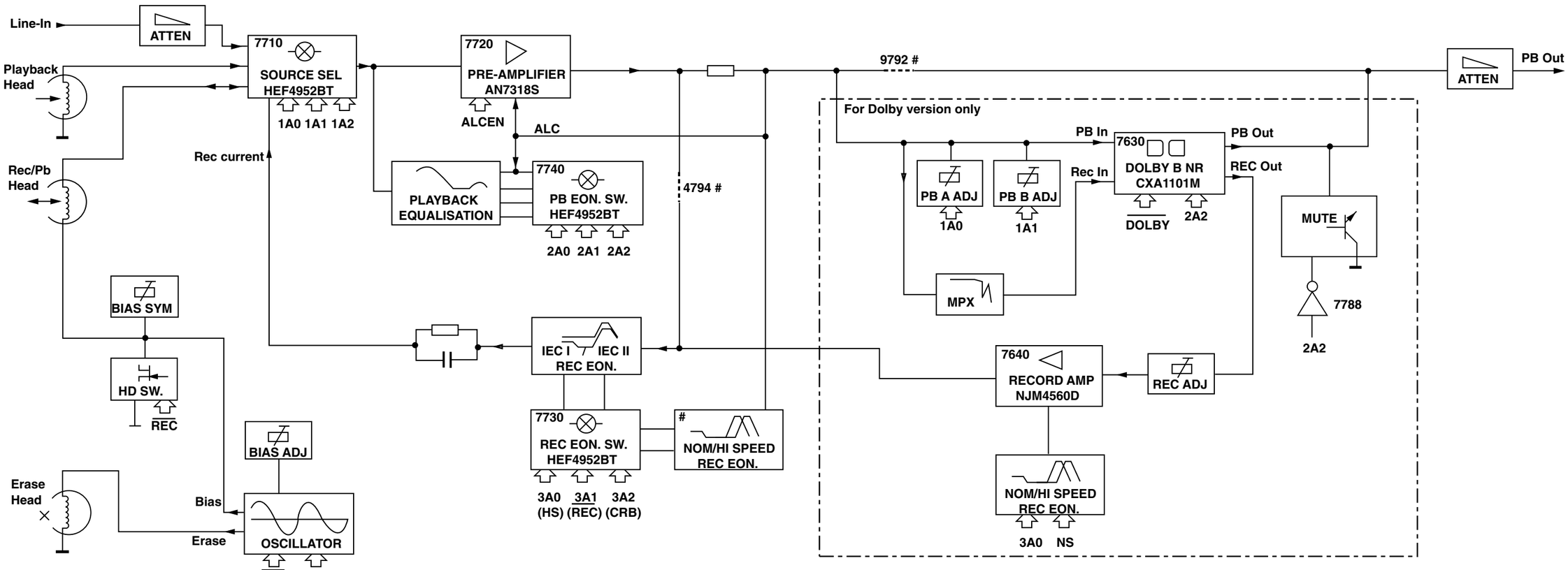
Variations table for Analog Circuit

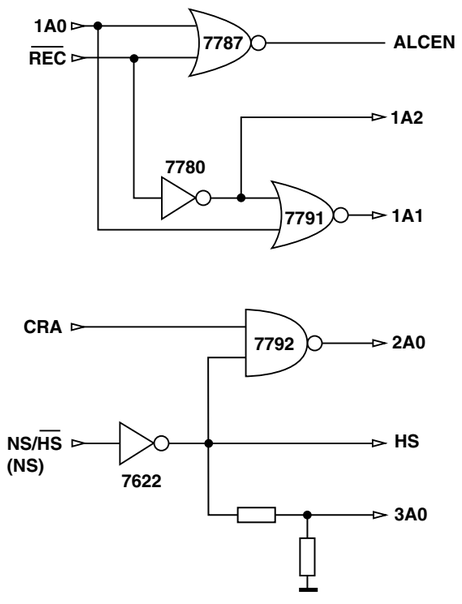
	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
2624	-	-	100nF
2701 , 2702	150pF	270pF	270pF
2703 , 2704	100pF	220pF	220pF
2717 , 2718	10nF	15nF	15nF
2721 , 2722	6,8nF	6,8nF	-
2727 , 2728	470pF	1nF	1nF
3616	10k	1k	1k
3618	6k8	-	-
3620	10k trimmer	-	-
3622	-	10k trimmer	10k trimmer
3672	4k7	-	-
3676	47k	-	-
3687	220R	220R	-
3688	680R	-	-
3723 , 3724	15k	18k	18k
3725 , 3726	10R	10R	-
3727 , 3728	5k6	6k8	6k8
3729 , 3730	3k3	4k7	4k7
3743 , 3744	1k5	2k2	2k2
3745 , 3746	3k3	5k6	5k6
3754 , 3755	1M	47R	47R

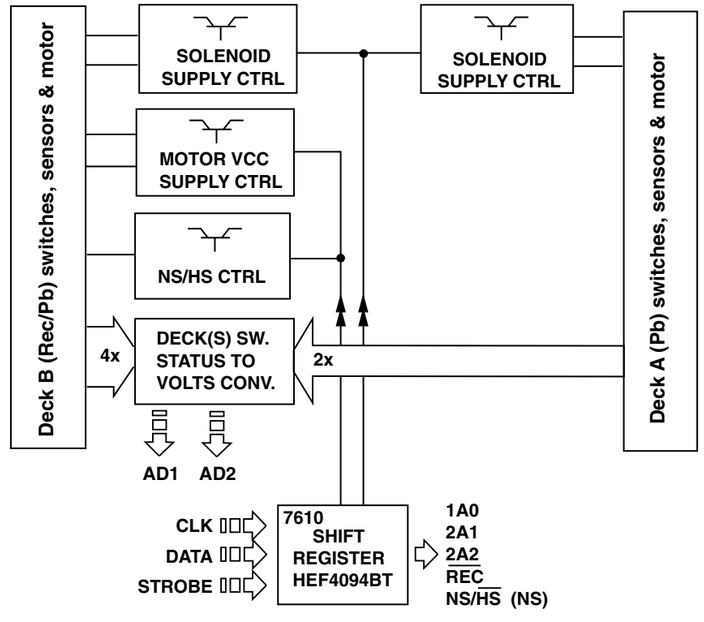
	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
3769	12k	8k2	8k2
3772	6k8	5k6	5k6
4785	-	-	0R jumper
3774	15k	8k2	8k2
6614	1N4148	-	-
7616	BC857B	-	-
7622	BC847B	-	-

9-2

BLOCK DIAGRAM







NOTE: # For Non-dolby version only
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

9-3

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

9-4

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

1	REC-L	Record input left
2	REC-R	Record input right
3	GND A	AF Ground
4	TAPE-L	Playback output left
5	+12V	D.C. supply (+12V) for AF electronics
6	TAPE-R	Playback output right
7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

1	GND M	Motor Ground
2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

1	AD2	Deck sensing switches output voltage / Deck A EOT
2	AD1	Deck sensing switches output voltage / Deck B EOT
3	+5V	DC supply +5V for ADC network
4	GND P	Control & Oscillator Ground
5	CLK	HEF4094BT shift register Clock line
6	DATA	HEF4094BT shift register Data line
7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON ***(For Non-Dolby version only)***

1	B R/P HD L+	R/P Head left channel positive
2	GND A	R/P Head return ground
3	B R/P HD R+	R/P Head right channel positive
4	ERASE HEAD	Erase Head
5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For Dolby B NR version only)***

1	B R/P HD L+	R/P Head left channel positive
2	B R/P HD L-	R/P Head left channel negative
3	B R/P HD R+	R/P Head right channel positive
4	B R/P HD R-	R/P Head right channel negative
5	ERASE HEAD	Erase Head
6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

1	A PB HD L+	Pb Head left channel positive
2	GND A	Pb Head return ground shield
3	A PB HD R+	Pb Head right channel positive

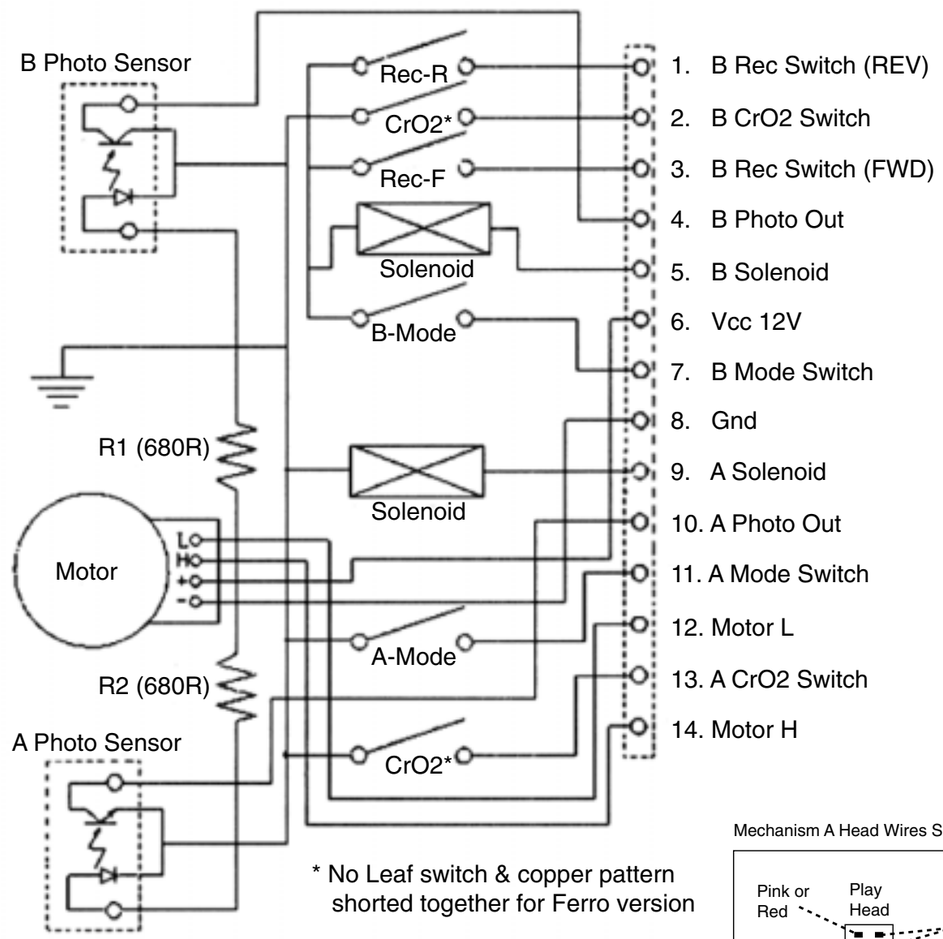
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE ***(For Dolby B NR version only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

CONNECTOR 1770 — DECK A & B CONTROL INTERFACE ***(For Non-Dolby version only)***

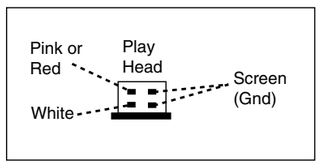
1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

TAPE MECHANISM ELECTRONICS

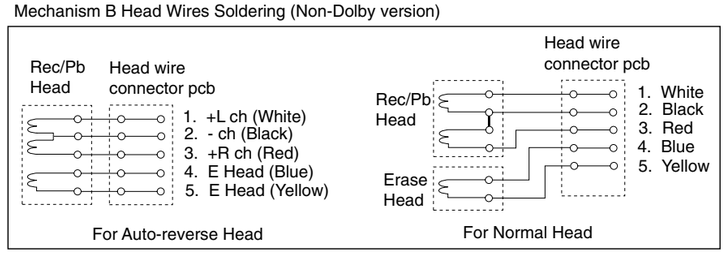


* No Leaf switch & copper pattern shorted together for Ferro version

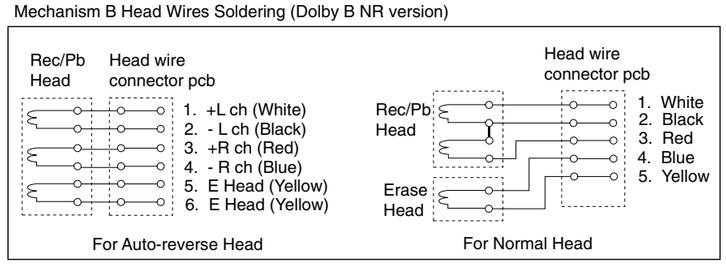
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)



TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	◇1 or ◇2 LEFT RIGHT	frequency counter	3620	3150Hz +/- 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check	<0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A^	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV +/- 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	THD-meter	check	<3% *

SBC419A^ : 4822 397 30069
SBC420 : 4822 397 30071

\# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-meaure
^ Not applicable for Ferro version

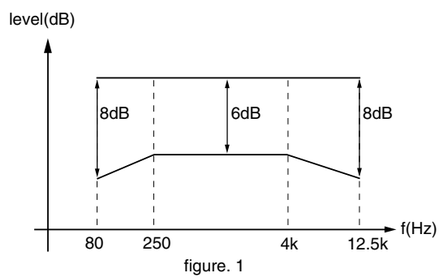


figure. 1

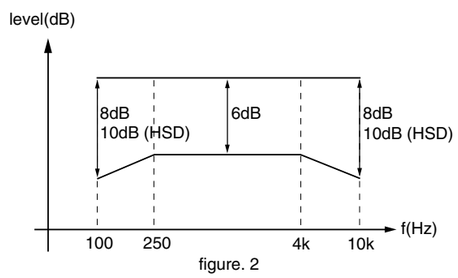
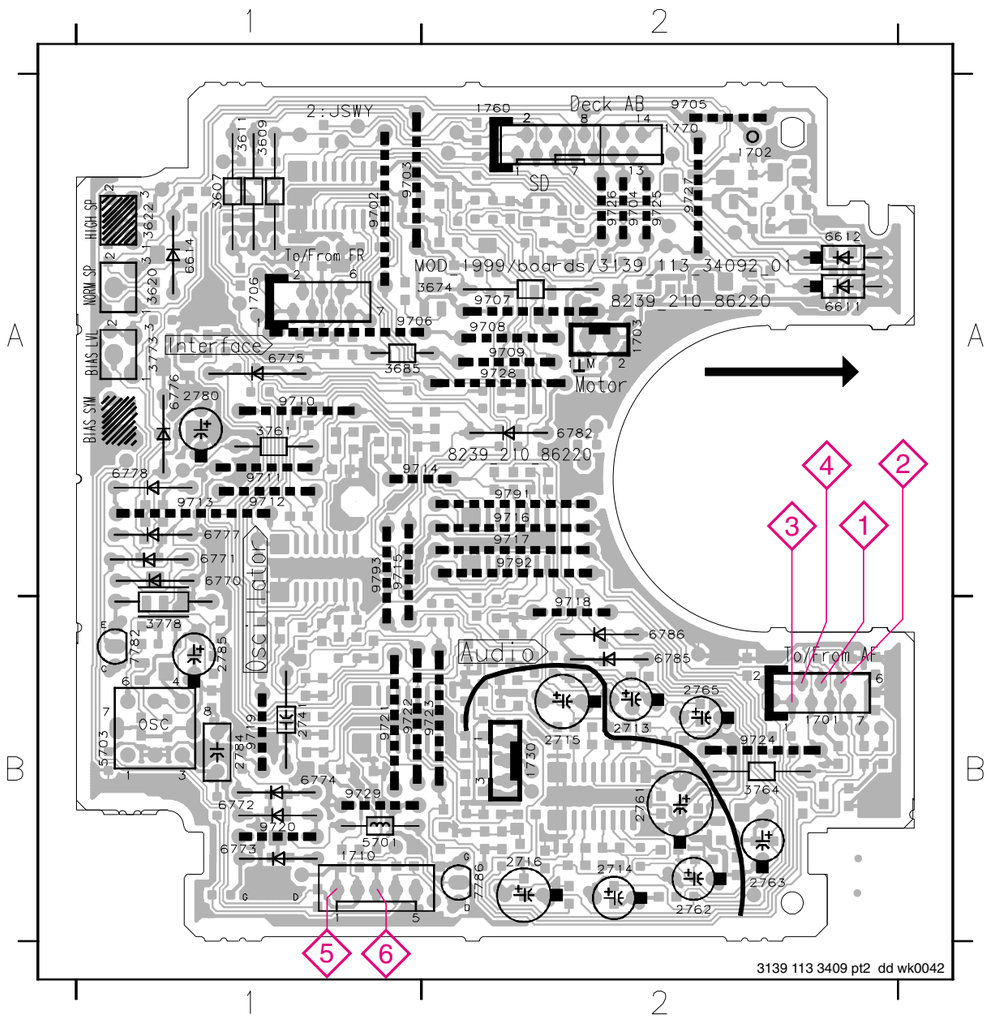


figure. 2

COMPONENT LAYOUT

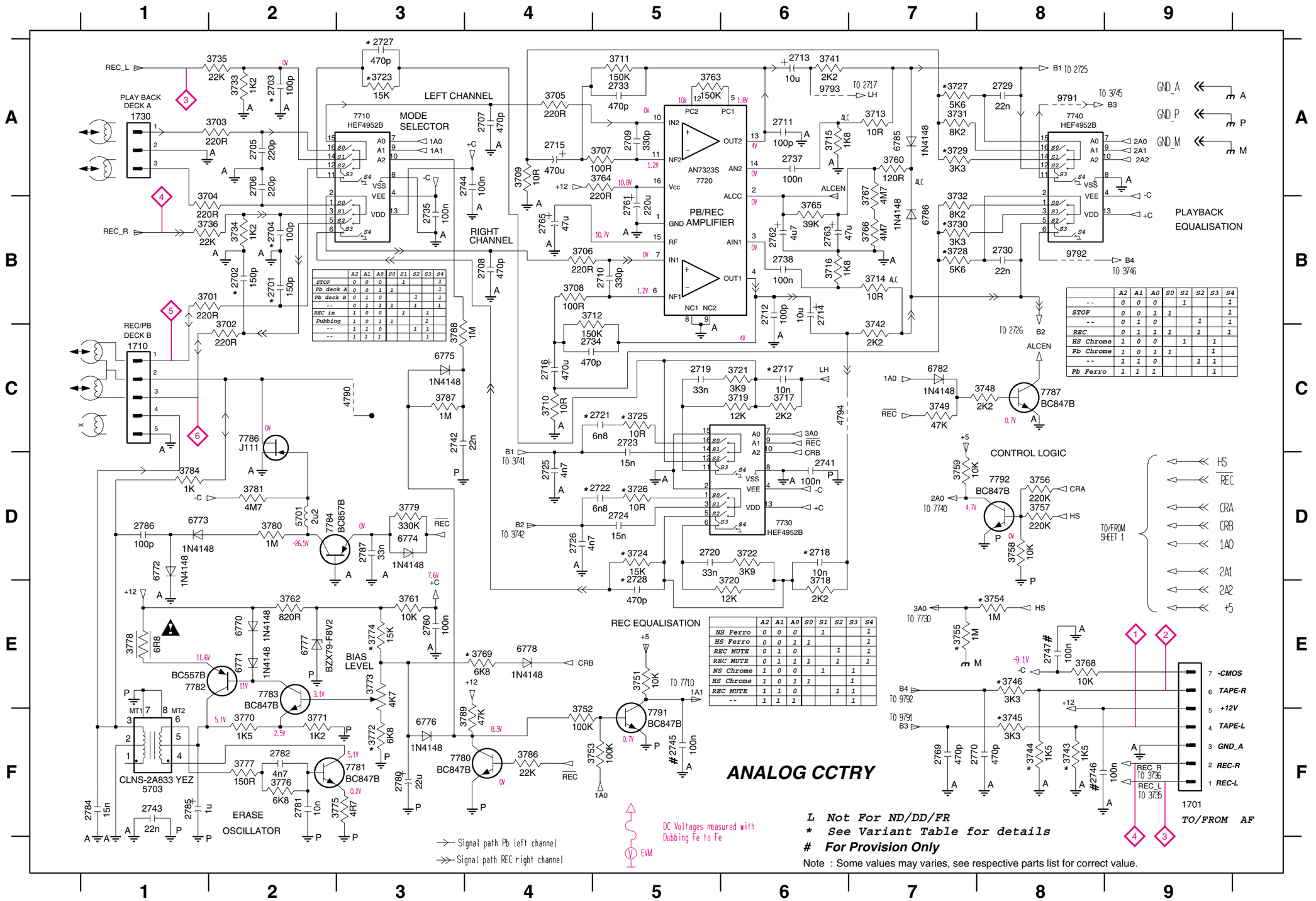
1701 B2	2714 B2	2784 B1	3761 A1	6770 A1	6782 A2	9706 A1	9715 A1	9724 B2
1702 A2	2715 B2	2785 B1	3764 B2	6771 A1	6785 B2	9707 A2	9716 A2	9725 A2
1703 A2	2716 B2	3607 A1	3773 A1	6772 B1	6786 B2	9708 A2	9717 A2	9726 A2
1706 A1	2741 B1	3609 A1	3778 B1	6773 B1	7782 B1	9709 A2	9718 B2	9727 A2
1710 B1	2761 B2	3611 A1	5701 B1	6774 B1	7786 B2	9710 A1	9719 B1	9728 A2
1730 B2	2762 B2	3620 A1	5703 B1	6775 A1	9702 A1	9711 A1	9720 B1	9729 B1
1760 A2	2763 B2	3622 A1	6611 A2	6776 A1	9703 A1	9712 A1	9721 B1	9791 A2
1770 A2	2765 B2	3674 A2	6612 A2	6777 A1	9704 A2	9713 A1	9722 B1	9792 A2
2713 B2	2780 A1	3685 A1	6614 A1	6778 A1	9705 A2	9714 A1	9723 B2	9793 A1


1
2
A
B
2:JSWY
1760
Deck AB
9705
1770
1702
SD
HIGH SP
WORM SP
BIAS W
BIAS MIN
To/From FR
MOD_1999/boards/3139_113_34092_01
8239_210_86220
3674
9707
9706
9708
9709
9728
Motor
Interface
6775
3685
1703
6782
8239_210_86220
9714
9710
9711
9713
9712
9791
9716
9717
9792
9718
Audio
To/From AF
Oscillator
OSC
2715
2713
2765
9724
2761
3764
2763
2762
2716
2714
1710
5701
9720
6772
6773
6774
6786
6785
5703
2784
2785
6778
6777
6771
6770
3778
9793
9715
9722
9723
3730
3761
6776
2780
3773
3622
3620
3614
3607
3611
3609
6612
6611
3764
3761
2741
2761
2762
2763
2716
2714
2715
2713
2765
9724
2784
2785
2780
3778

9-7

ANALOG CIRCUIT

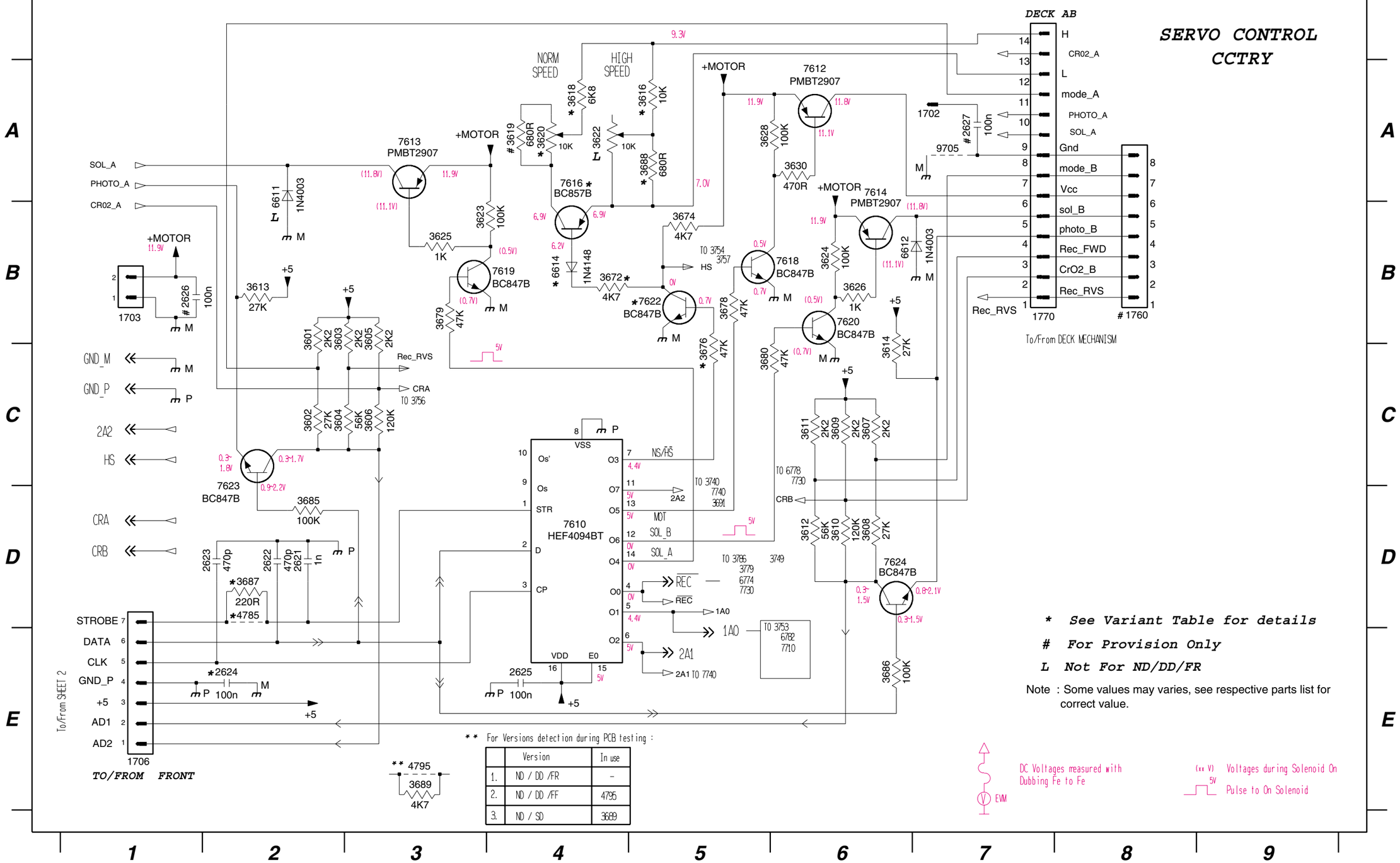
1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	

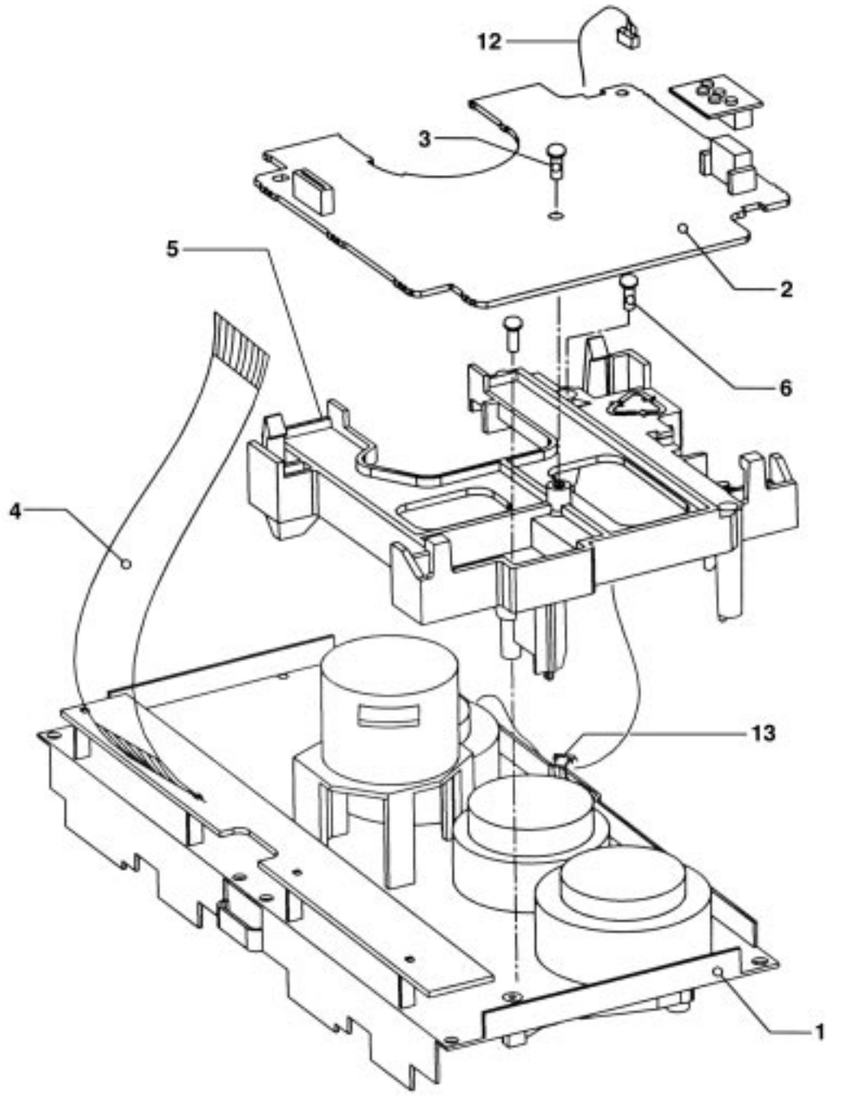


9-8

SERVO CONTROL CIRCUIT

1702 A7 1760 B8 2622 D2 2625 E4 3601 B2 3604 C2 3607 C6 3610 D6 3613 B2 3618 A4 3622 A4 3625 B3 3630 A6 3676 C5 3680 C5 3687 D2 4785 D2 6612 B6 7612 A6 7616 A4 7620 B6 7624 D6
1703 B1 1770 B7 2623 D2 2626 B1 3602 C2 3605 B3 3608 D6 3611 C6 3614 C6 3619 A4 3623 B3 3626 B6 3628 B4 3674 B5 3679 B3 3685 D2 3688 A5 4795 E3 6611 A2 6614 B4 7610 D4 7614 A6 7618 B4 7622 B5 9705 A7
1706 E1 2621 D2 2624 E2 2627 A7 3603 B2 3606 C3 3609 C6 3612 D6 3616 A5 3620 A4 3624 B6 3628 A5 3674 B5 3679 B3 3686 E6 3689 E3 6611 A2 7610 D4 7613 A6 7617 B4 7619 B5 7623 D2





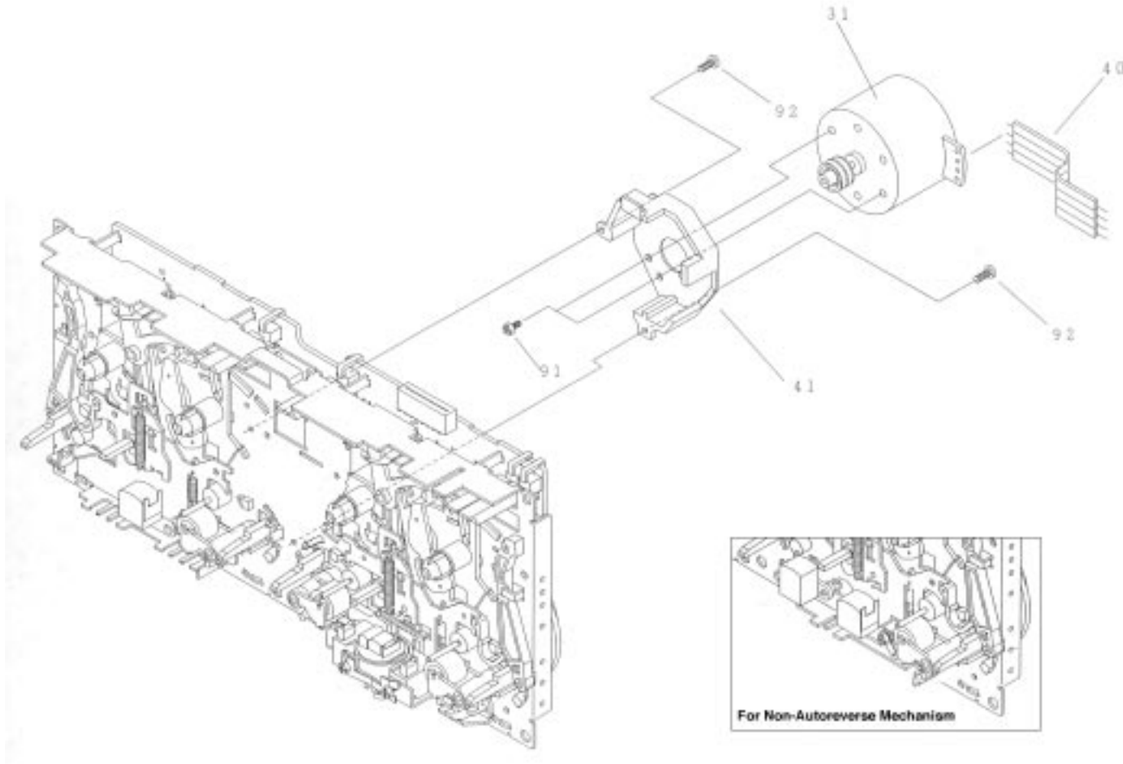
3139 118 77070 (Incl. ...77080) dd wk926

TAPE MODULE EXPLODED VIEW

1	3139 118 77130	Autoreverse Mech. CWE44FR01
1	3139 118 77140	Non-Autoreverse Mech. CWE44FF02 Chrome/Ferro
1	3139 118 77950	Non-Autoreverse Mech. CWE44FF05 Ferro
3	-	Screw D3 x 10
6	-	Screw M2 x 16
7	3139 110 34080	Flex Cable 14 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.

9-9



TAPE MECHANISM - MOTOR EXPLODED VIEW

31	4822 361 11055	Motor Assembly
91	-	Screw M2,6 x 5
92	-	Screw M2 x 5

Note: Only the parts mentioned in this list are normal service spare parts.

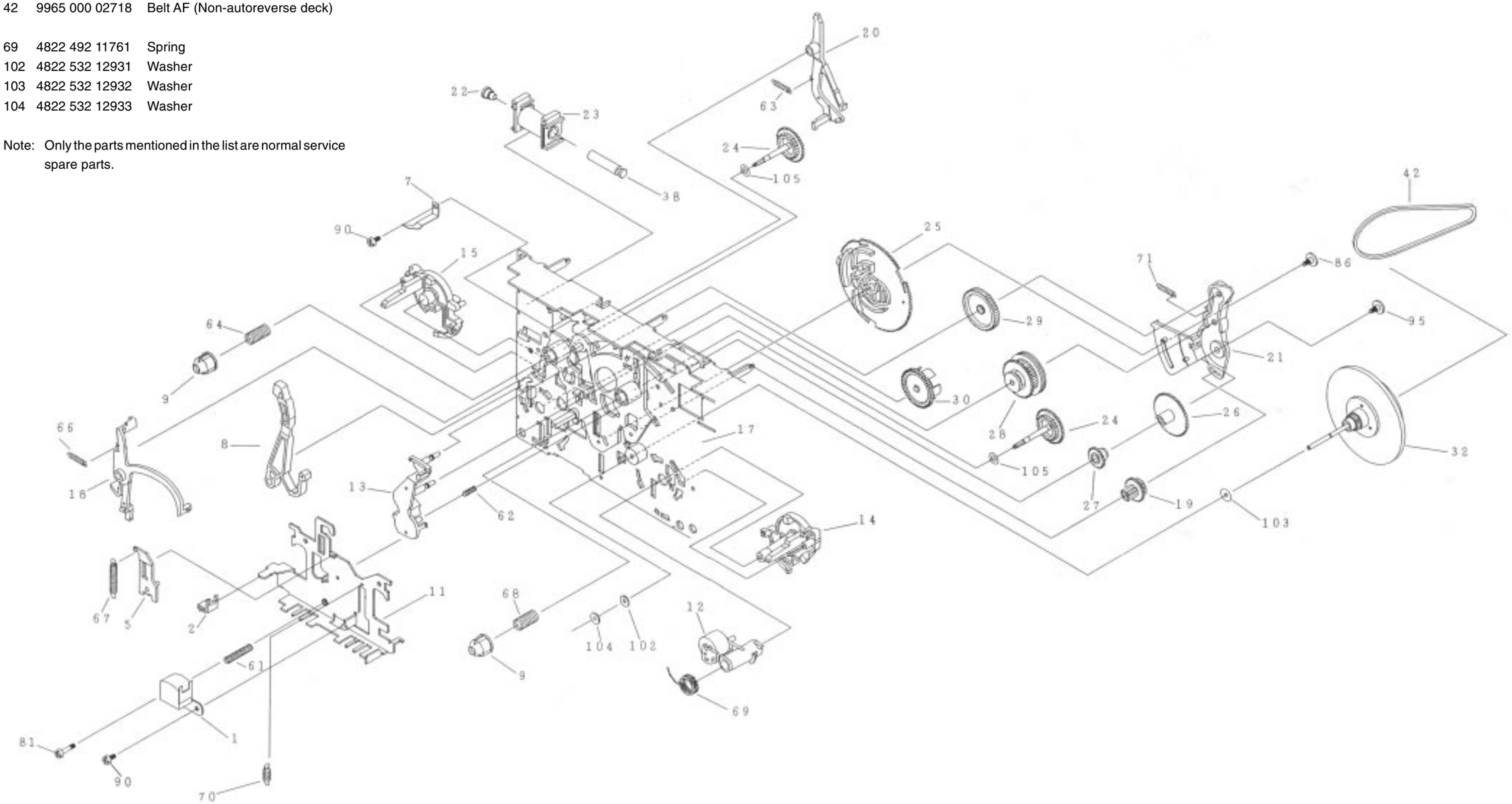
9-10

TAPE MECHANISM A - PLAY

MECHANICAL PARTS - PLAY MECHANISM

1	9965 000 02313	Play Head (Non-Autoreverse deck)
1	9965 000 02321	Play Head (Autoreverse deck)
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
42	9965 000 02315	Belt AF (Autoreverse deck)
42	9965 000 02718	Belt AF (Non-autoreverse deck)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



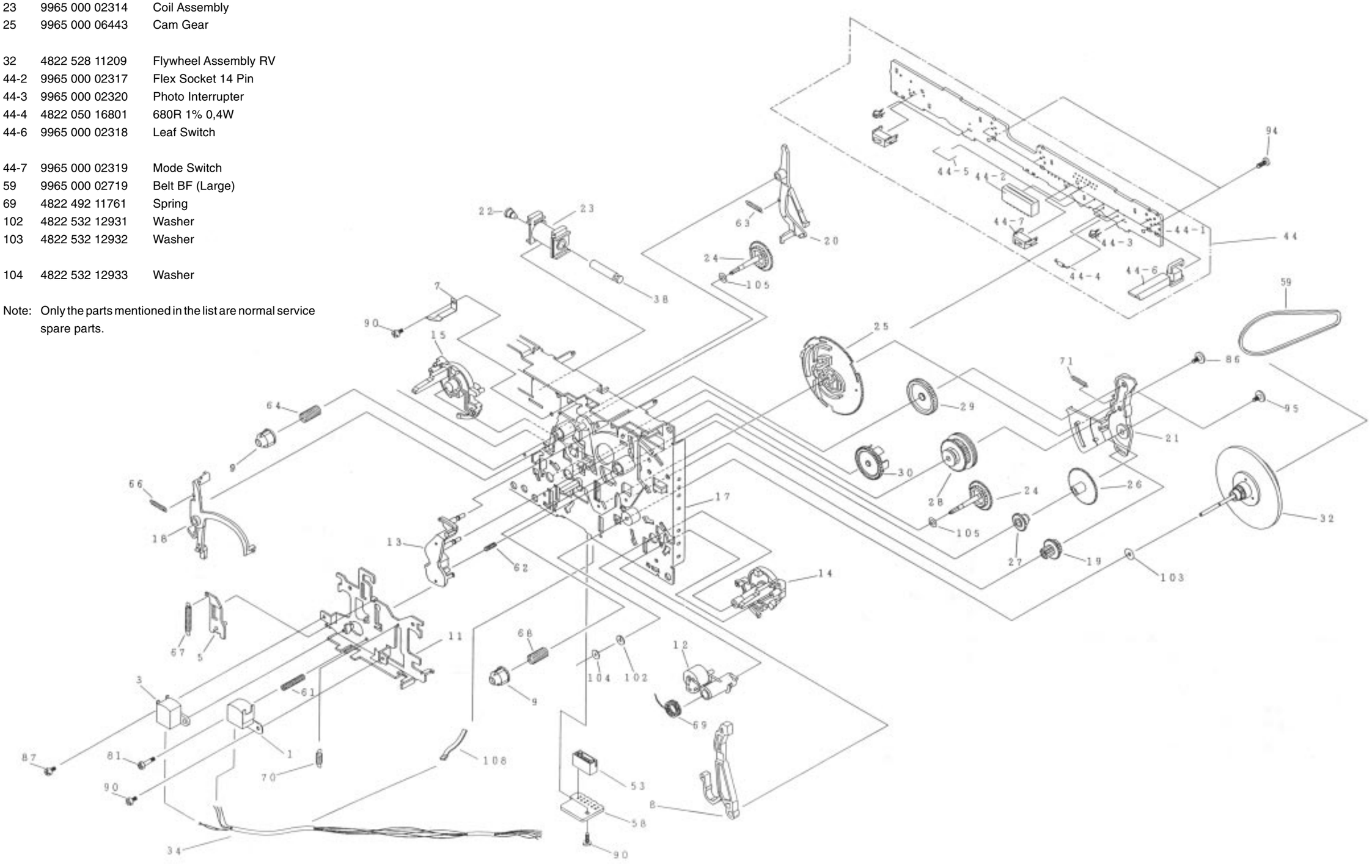
9-11

TAPE MECHANISM B - RECORD/PLAYBACK *(Non-Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

1	9965 000 02313	Play Head
3	9965 000 02600	Head, Erase
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
59	9965 000 02719	Belt BF (Large)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



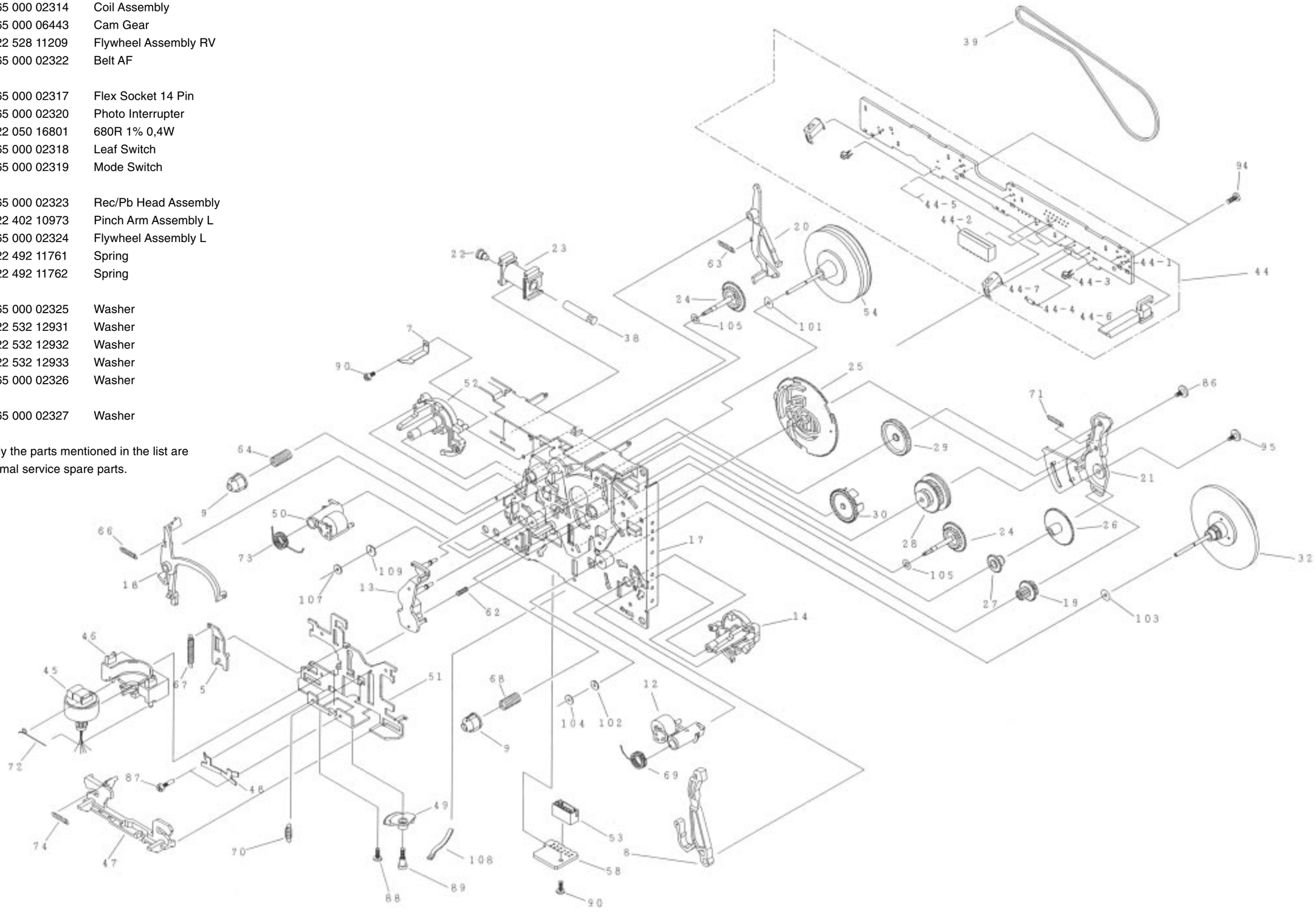
9-12

TAPE MECHANISM B - RECORD/PLAYBACK *(Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
39	9965 000 02322	Belt AF
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
45	9965 000 02323	Rec/Pb Head Assembly
50	4822 402 10973	Pinch Arm Assembly L
54	9965 000 02324	Flywheel Assembly L
69	4822 492 11761	Spring
73	4822 492 11762	Spring
101	9965 000 02325	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
107	9965 000 02326	Washer
109	9965 000 02327	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



9-13

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Socket 7pin Vert.
1706	482226710953	Flex Socket 7pin Vert.
1770	482226751255	Flex Socket 14pin Vert.

CAPACITORS

2621	532212231647	1nF 10% 63V
2622	532212234099	470pF 10% 63V
2623	532212234099	470pF 10% 63V
2624	482212614585	100nF 10% 50V only for Ferro
2625	482212614585	100nF 10% 50V
2701	532212233538	150pF 2% 63V Autoreverse
2701	482212233216	270pF 5% 63V Non-autoreverse
2702	532212233538	150pF 2% 63V Autoreverse
2702	482212233216	270pF 5% 63V Non-autoreverse
2703	532212232531	100pF 5% 50V Autoreverse
2703	482212233575	220pF 5% 63V Non-autoreverse
2704	532212232531	100pF 5% 50V Autoreverse
2704	482212233575	220pF 5% 63V Non-autoreverse
2705	482212233575	220pF 5% 63V
2706	482212233575	220pF 5% 63V
2707	532212234099	470pF 10% 63V
2708	532212234099	470pF 10% 63V
2709	532212231863	330pF 5% 63V
2710	532212231863	330pF 5% 63V
2711	532212232531	100pF 5% 50V
2712	532212232531	100pF 5% 50V
2713	482212440248	10µF 20% 63V
2714	482212440248	10µF 20% 63V
2715	482212480195	470µF 20% 10V
2716	482212480195	470µF 20% 10V
2717	482212233177	10nF 20% 50V Autoreverse
2717	482212613188	15nF 5% 63V Non-autoreverse
2718	482212233177	10nF 20% 50V Autoreverse
2718	482212613188	15nF 5% 63V Non-autoreverse
2719	482212612105	33nF 5% 50V
2720	482212612105	33nF 5% 50V
2721	532212231866	6,8nF 10% 63V not for Ferro
2722	532212231866	6,8nF 10% 63V not for Ferro
2723	482212613188	15nF 5% 63V
2724	482212613188	15nF 5% 63V
2725	532212610223	4,7nF 10% 63V
2726	532212610223	4,7nF 10% 63V
2727	532212234099	470pF 10% 63V Autoreverse
2727	532212231647	1nF 10% 63V Non-autoreverse
2728	532212234099	470pF 10% 63V Autoreverse
2728	532212231647	1nF 10% 63V Non-autoreverse
2729	532212232654	22nF 10% 63V
2730	532212232654	22nF 10% 63V
2733	532212234099	470pF 10% 63V
2734	532212234099	470pF 10% 63V
2735	482212614585	100nF 10% 50V
2737	482212614585	100nF 10% 50V
2738	482212614585	100nF 10% 50V
2741	482212611585	22nF +80/-20% 25V
2742	532212232654	22nF 10% 63V
2743	532212232654	22nF 10% 63V
2744	482212614585	100nF 10% 50V
2760	482212614585	100nF 10% 50V
2761	482212480144	220µF 20% 25V
2762	482212440769	4,7µF 20% 100V
2763	482212440433	47µF 20% 25V
2765	482212440433	47µF 20% 25V
2769	532212234099	470pF 10% 63V
2770	532212234099	470pF 10% 63V
2780	482212481151	22µF 20% 50V
2781	482212233177	10nF 20% 50V
2782	532212610223	4,7nF 10% 63V
2784	482212151305	15nF 10% 50V
2785	482212421913	1µF 20% 63V
2786	532212232531	100pF 5% 50V
2787	482212612105	33nF 5% 50V

RESISTORS

3601	482211711449	2k2 1% 0,1W
3602	482205120273	27k 5% 0,1W
3603	482211711449	2k2 1% 0,1W
3604	482211711148	56k 1% 0,1W
3605	482211711449	2k2 1% 0,1W
3606	482205120124	120k 5% 0,1W
3607	482211652256	2k2 5% 0,5W
3608	482205120273	27k 5% 0,1W
3609	482211652256	2k2 5% 0,5W
3610	482205120124	120k 5% 0,1W
3611	482211652256	2k2 5% 0,5W
3612	482211711148	56k 1% 0,1W
3613	482205120273	27k 5% 0,1W
3614	482205120273	27k 5% 0,1W
3616	482211710833	10k 1% 0,1W Autoreverse
3616	482205110102	1k 2% 0,25W Non-autoreverse
3618	482211711507	6k8 1% 0,1W Autoreverse
3620	482210011141	Trim. 10k 30% Autoreverse
3622	482210011141	Trim. 10k 30% Non-autoreverse
3623	482211710837	100k 1% 0,1W
3624	482211710837	100k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3628	482211710837	100k 1% 0,1W
3630	482205120471	470R 5% 0,1W
3672	482205120472	4k7 5% 0,1W Autoreverse
3674	482211652283	4k7 5% 0,5W
3676	482211710834	47k 1% 0,1W Autoreverse
3678	482211710834	47k 1% 0,1W
3679	482211710834	47k 1% 0,1W
3680	482211710834	47k 1% 0,1W
3685	482211652234	100k 5% 0,5W
3686	482211710837	100k 1% 0,1W
3687	482211711503	220R 1% 0,1W not for Ferro
3688	482211710361	680R 1% 0,1W Autoreverse
3701	482211711503	220R 1% 0,1W
3702	482211711503	220R 1% 0,1W
3703	482211711503	220R 1% 0,1W
3704	482211711503	220R 1% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482211711503	220R 1% 0,1W
3707	482205120101	100R 5% 0,1W
3708	482205120101	100R 5% 0,1W
3709	482205120109	10R 5% 0,1W
3710	482205120109	10R 5% 0,1W
3711	482205120154	150k 5% 0,1W
3712	482205120154	150k 5% 0,1W
3713	482205120109	10R 5% 0,1W
3714	482205120109	10R 5% 0,1W
3715	482205120182	1k8 5% 0,1W
3716	482205120182	1k8 5% 0,1W
3717	482211711449	2k2 1% 0,1W
3718	482211711449	2k2 1% 0,1W
3719	482211711383	12k 1% 0,1W
3720	482211711383	12k 1% 0,1W
3721	482205120392	3k9 5% 0,1W
3722	482205120392	3k9 5% 0,1W
3723	482211683933	15k 1% 0,1W Autoreverse
3723	482211710965	18k 1% 0,1W Non-autoreverse
3724	482211683933	15k 1% 0,1W Autoreverse
3724	482211710965	18k 1% 0,1W Non-autoreverse
3725	482205120109	10R 5% 0,1W not for Ferro
3726	482205120109	10R 5% 0,1W not for Ferro
3727	482205120562	5k6 5% 0,1W Autoreverse
3727	482211711507	6k8 1% 0,1W Non-autoreverse
3728	482205120562	5k6 5% 0,1W Autoreverse
3728	482211711507	6k8 1% 0,1W Non-autoreverse
3729	482205120332	3k3 5% 0,1W Autoreverse
3729	482205120472	4k7 5% 0,1W Non-autoreverse
3730	482205120332	3k3 5% 0,1W Autoreverse
3730	482205120472	4k7 5% 0,1W Non-autoreverse
3731	482205120822	8k2 5% 0,1W
3732	482205120822	8k2 5% 0,1W
3733	482205120122	1k2 5% 0,1W
3734	482205120122	1k2 5% 0,1W
3735	482205120223	22k 5% 0,1W
3736	482205120223	22k 5% 0,1W
3741	482211711449	2k2 1% 0,1W
3742	482211711449	2k2 1% 0,1W
3743	482211711139	1k5 1% 0,1W Autoreverse
3743	482211711449	2k2 1% 0,1W Non-autoreverse
3744	482211711139	1k5 1% 0,1W Autoreverse
3744	482211711449	2k2 1% 0,1W Non-autoreverse
3745	482205120332	3k3 5% 0,1W Autoreverse
3745	482205120562	5k6 5% 0,1W Non-autoreverse
3746	482205120332	3k3 5% 0,1W Autoreverse
3746	482205120562	5k6 5% 0,1W Non-autoreverse
3748	482211711449	2k2 1% 0,1W
3749	482211710834	47k 1% 0,1W
3751	482211710833	10k 1% 0,1W
3752	482211710837	100k 1% 0,1W
3753	482211710837	100k 1% 0,1W
3754	482205120105	1M 5% 0,1W Autoreverse
3754	482205120479	47R 5% 0,1W Non-autoreverse
3755	482205120105	1M 5% 0,1W Autoreverse
3755	482205120479	47R 5% 0,1W Non-autoreverse
3756	482211713579	220k 1% 0,1W
3757	482211713579	220k 1% 0,1W
3758	482211710833	10k 1% 0,1W
3759	482211710833	10k 1% 0,1W
3760	482205120121	120R 5% 0,1W
3761	482205021003	10k 1% 0,6W
3762	482211711454	820R 1% 0,1W
3763	482205120154	150k 5% 0,1W
3764	482211683872	220R 5% 0,5W
3765	482205120393	39k 5% 0,1W
3766	482205120475	4M7 5% 0,1W
3767	482205120475	4M7 5% 0,1W
3768	482211710833	10k 1% 0,1W
3769	482211711383	12k 1% 0,1W Autoreverse
3769	482205120822	8k2 5% 0,1W Non-autoreverse
3770	482211711139	1k5 1% 0,1W
3771	482205120122	1k2 5% 0,1W
3772	482211711507	6k8 1% 0,1W Autoreverse
3772	482205120562	5k6 5% 0,1W Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W
3774	482211683933	15k 1% 0,1W Autoreverse
3774	482205120822	8k2 5% 0,1W Non-autoreverse
3775	482205120478	4R7 5% 0,1W
3776	482211711507	6k8 1% 0,1W
3777	482211710353	150R 1% 0,1W
3778	482205210688	⚠ 6R8 5% 0,33W
3779	482205120334	330k 5% 0,1W
3780	482205120105	1M 5% 0,1W
3781	482205120475	4M7 5% 0,1W
3784	482205110102	1k 2% 0,25W
3786	482205120223	22k 5% 0,1W
3787	482205120105	1M 5% 0,1W
3788	482205120105	1M 5% 0,1W
3789	482211710834	47k 1% 0,1W
4701	482205120008	0R Jumper 0805
4702	482205120008	0R Jumper 0805
4703	482205120008	0R Jumper 0805
4704	482205120008	0R Jumper 0805
4705	482205120008	0R Jumper 0805

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ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

RESISTORS

4706	482205120008	0R Jumper 0805	
4707	482205120008	0R Jumper 0805	
4708	482205120008	0R Jumper 0805	
4709	482205120008	0R Jumper 0805	
4710	482205120008	0R Jumper 0805	
4711	482205120008	0R Jumper 0805	
4712	482205120008	0R Jumper 0805	
4713	482205120008	0R Jumper 0805	
4714	482205120008	0R Jumper 0805	
4715	482205120008	0R Jumper 0805	
4716	482205120008	0R Jumper 0805	
4717	482205120008	0R Jumper 0805	
4718	482205120008	0R Jumper 0805	
4719	482205120008	0R Jumper 0805	
4720	482205120008	0R Jumper 0805	
4721	482205120008	0R Jumper 0805	
4722	482205120008	0R Jumper 0805	
4723	482205120008	0R Jumper 0805	
4724	482205120008	0R Jumper 0805	
4725	482205120008	0R Jumper 0805	
4726	482205120008	0R Jumper 0805	
4727	482205120008	0R Jumper 0805	
4728	482205120008	0R Jumper 0805	
4729	482205120008	0R Jumper 0805	
4730	482205120008	0R Jumper 0805	
4731	482205120008	0R Jumper 0805	
4732	482205120008	0R Jumper 0805	
4733	482205120008	0R Jumper 0805	
4734	482205120008	0R Jumper 0805	
4735	482205120008	0R Jumper 0805	
4736	482205120008	0R Jumper 0805	
4737	482205120008	0R Jumper 0805	
4738	482205120008	0R Jumper 0805	
4739	482205120008	0R Jumper 0805	
4740	482205120008	0R Jumper 0805	
4741	482205120008	0R Jumper 0805	
4742	482205120008	0R Jumper 0805	
4744	482205120008	0R Jumper 0805	
4745	482205120008	0R Jumper 0805	
4746	482205120008	0R Jumper 0805	
4748	482205120008	0R Jumper 0805	
4785	482205120008	0R Jumper 0805	only for Ferro
4790	482205120008	0R Jumper 0805	
4794	482205120008	0R Jumper 0805	
4795	482205120008	0R Jumper 0805	

COILS & FILTERS

5701	482215711477	Coil 2,2µH 5%
5703	482215620946	Osc Coil 100kHz

DIODES

6611	482213031878	1N4003G
6612	482213031878	1N4003G
6614	482213030621	1N4148 Autoreverse
6770	482213030621	1N4148
6771	482213030621	1N4148
6772	482213030621	1N4148
6773	482213030621	1N4148
6774	482213030621	1N4148
6775	482213030621	1N4148
6776	482213030621	1N4148
6777	482213034382	BZX79-F8V2
6778	482213030621	1N4148
6782	482213030621	1N4148
6785	482213030621	1N4148
6786	482213030621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT	
7612	482213011201	PMBT2907	
7613	482213011201	PMBT2907	
7614	482213011201	PMBT2907	
7616	482213060373	BC857B	Autoreverse
7618	482213060511	BC847B	
7619	482213060511	BC847B	
7620	482213060511	BC847B	
7622	482213060511	BC847B	Autoreverse
7623	482213060511	BC847B	
7624	482213060511	BC847B	
7710	482220932919	HEF4952BT	
7720	932214000668	AN7323S	
7730	482220932919	HEF4952BT	
7740	482220932919	HEF4952BT	
7780	482213060511	BC847B	
7781	482213042804	BC817-25	
7782	482213044568	BC557B	
7783	482213060511	BC847B	
7784	482213060373	BC857B	
7786	482213063494	J111	
7787	482213060511	BC847B	
7791	482213060511	BC847B	
7792	482213060511	BC847B	

Note: Only the parts mentioned in this list are normal service spare parts.

3CDC-LC-VCD

(3 Disc Carousel Changer)

Layout stage .2

This module is not intended to be repaired on component level.
Circuit Diagram and Printed Circuit Board drawings
are published for orientation only.
In case of defects please replace the entire board and mechanism.
The CD Board can be ordered with codenumber “9940 000 02968”.
The CDC module can be ordered with codenumber “9940 000 02993”.

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Service hints

CAUTION

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
• SWITCH OFF POWER SUPPLY
• ESD PROTECTION
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip onto the flexfoil cable to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil cable and connect it to the new CD drive
5. Position the new CD drive on its studs
6. Remove solder joint from the Laser unit (see below)

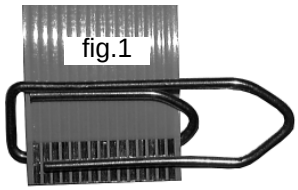
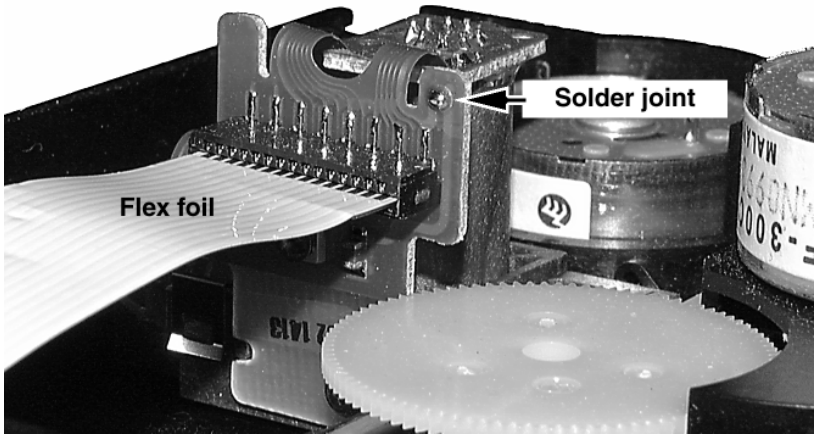


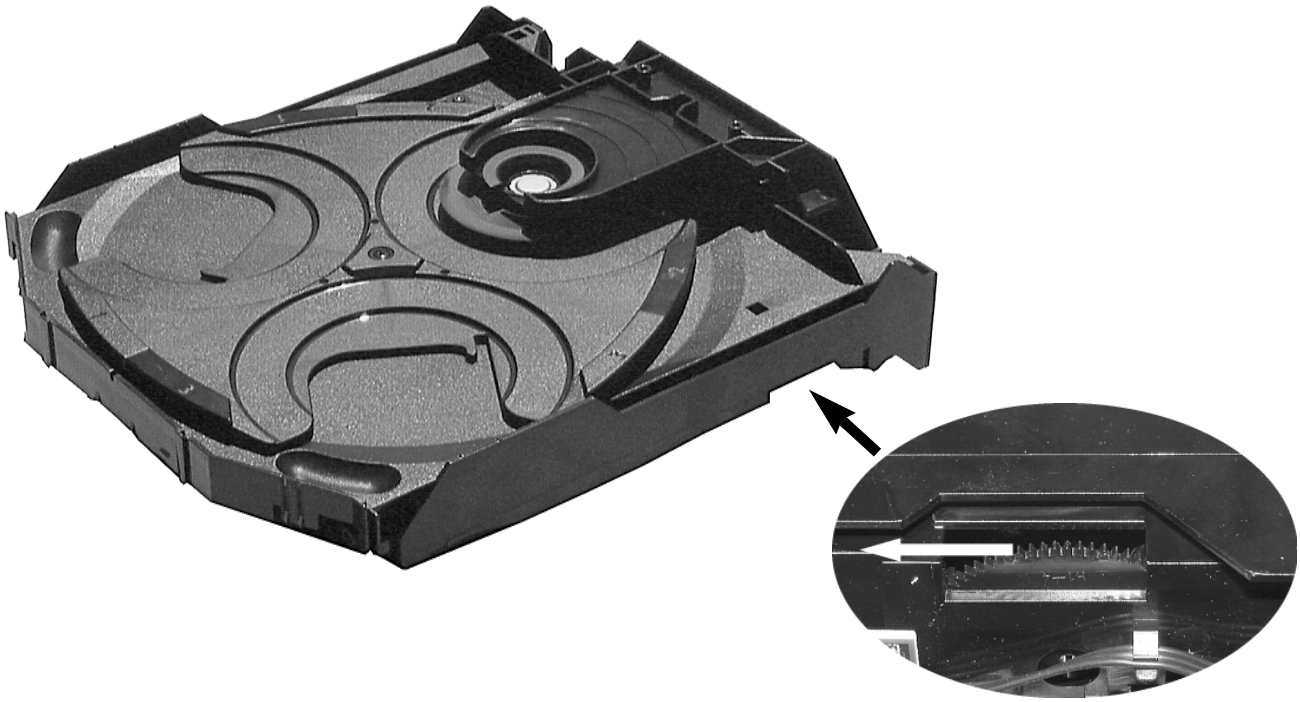
fig.1

Attention: The laser diode of this CD drive is protected against ESD by a solder joint which short-circuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connecting the drive to the set.



Emergency open

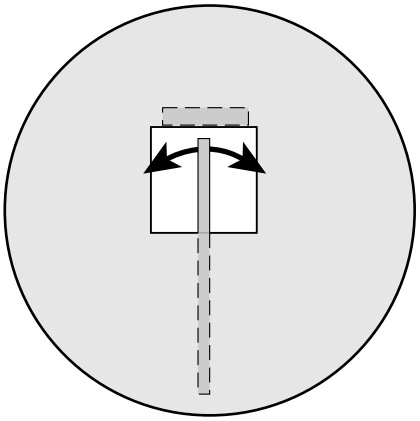
In case of a Supply fault, the tray can be opened manually.
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



Service hints

Dismantling of Tray

1. Open the tray.
2. Release 2x catch as shown in fig. 2 and Detail A
3. Pull tray out.



Detail A

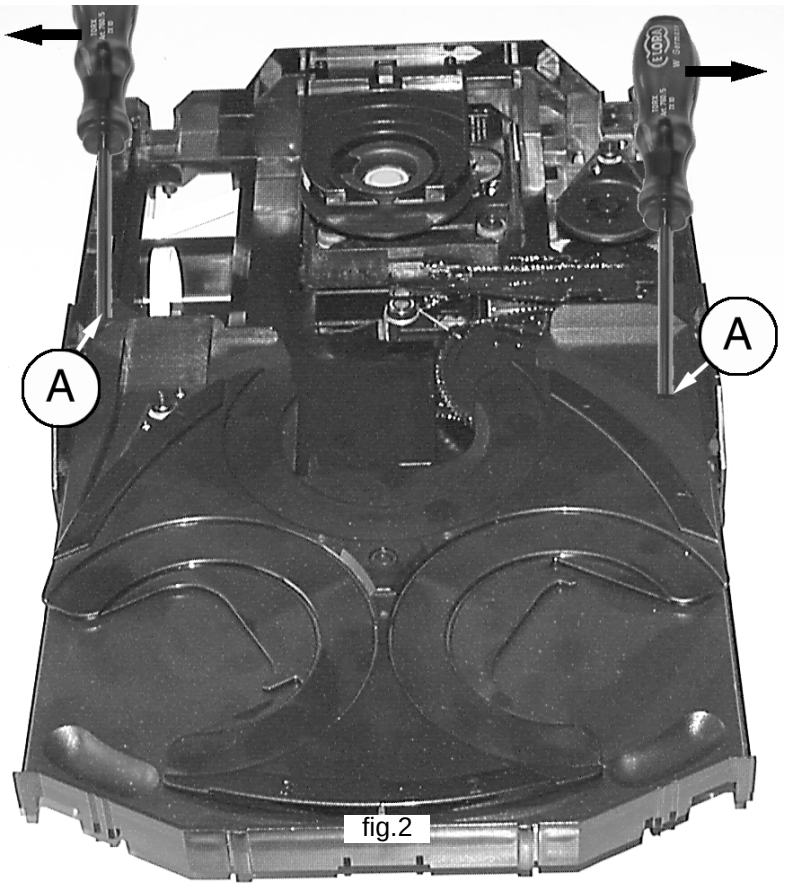
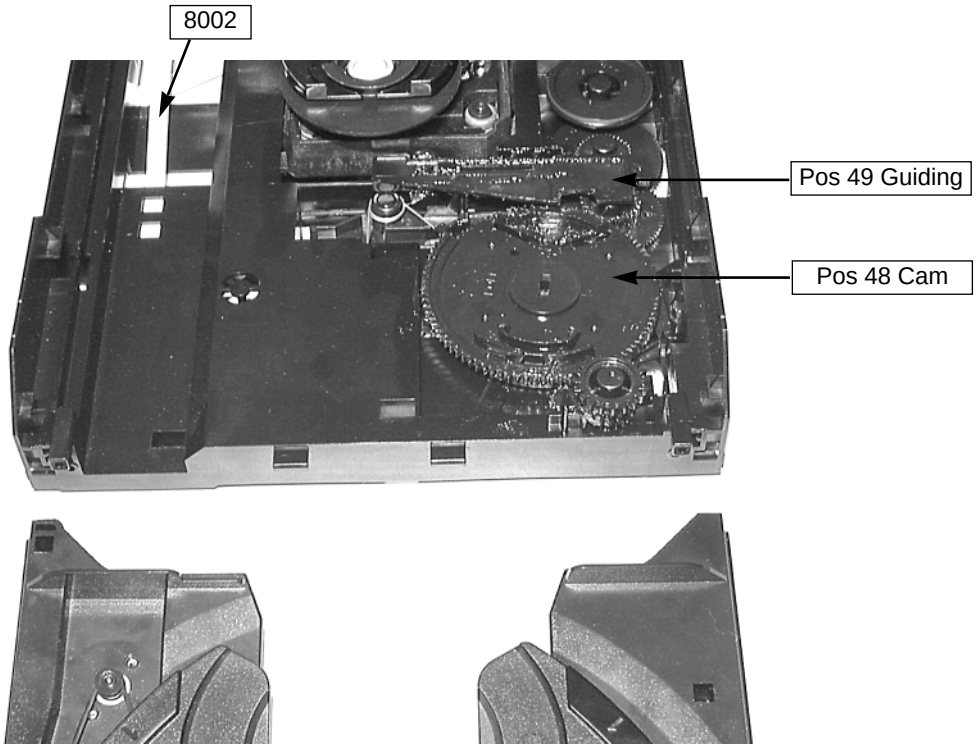


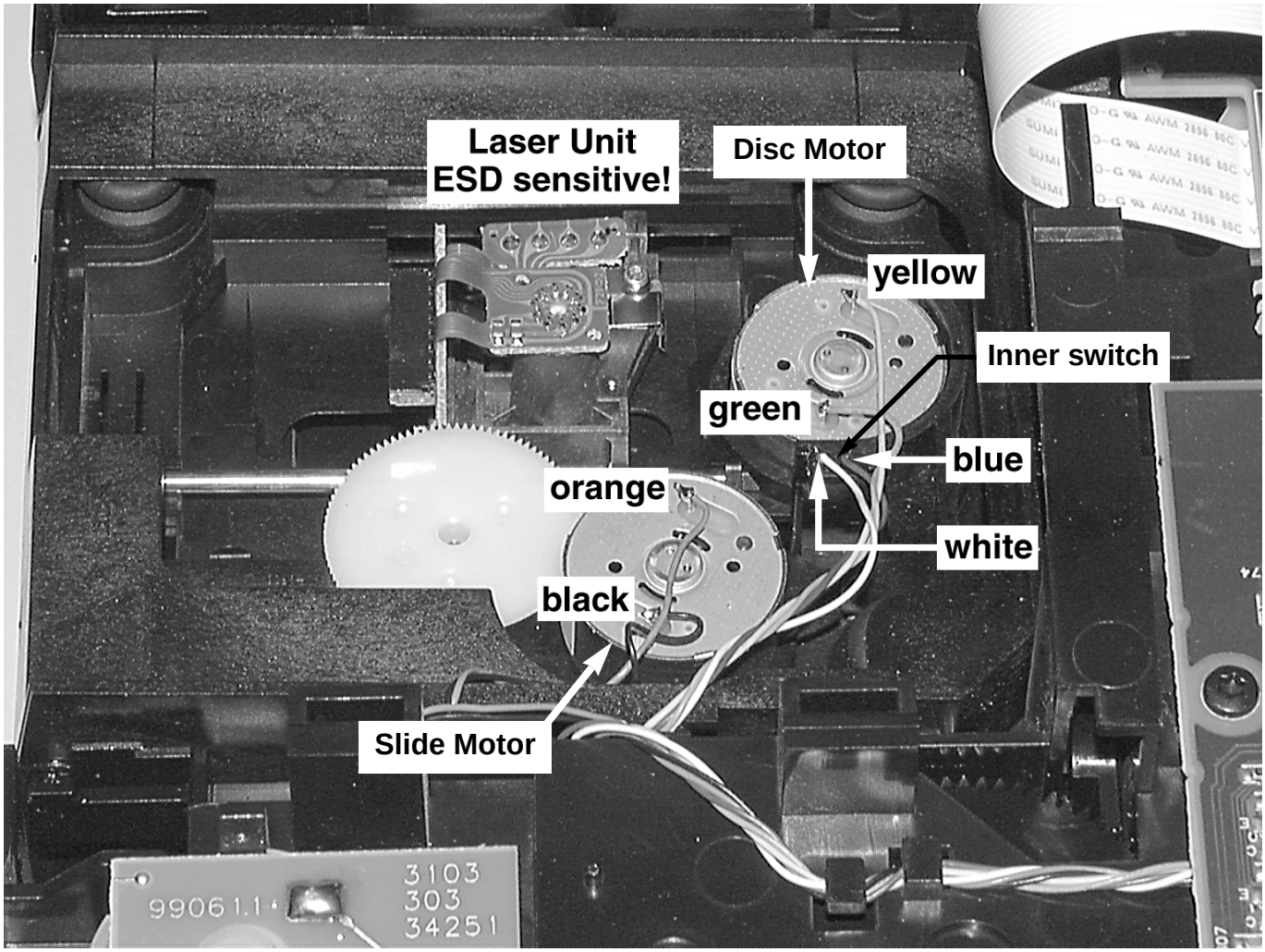
fig.2

Assembling of Tray

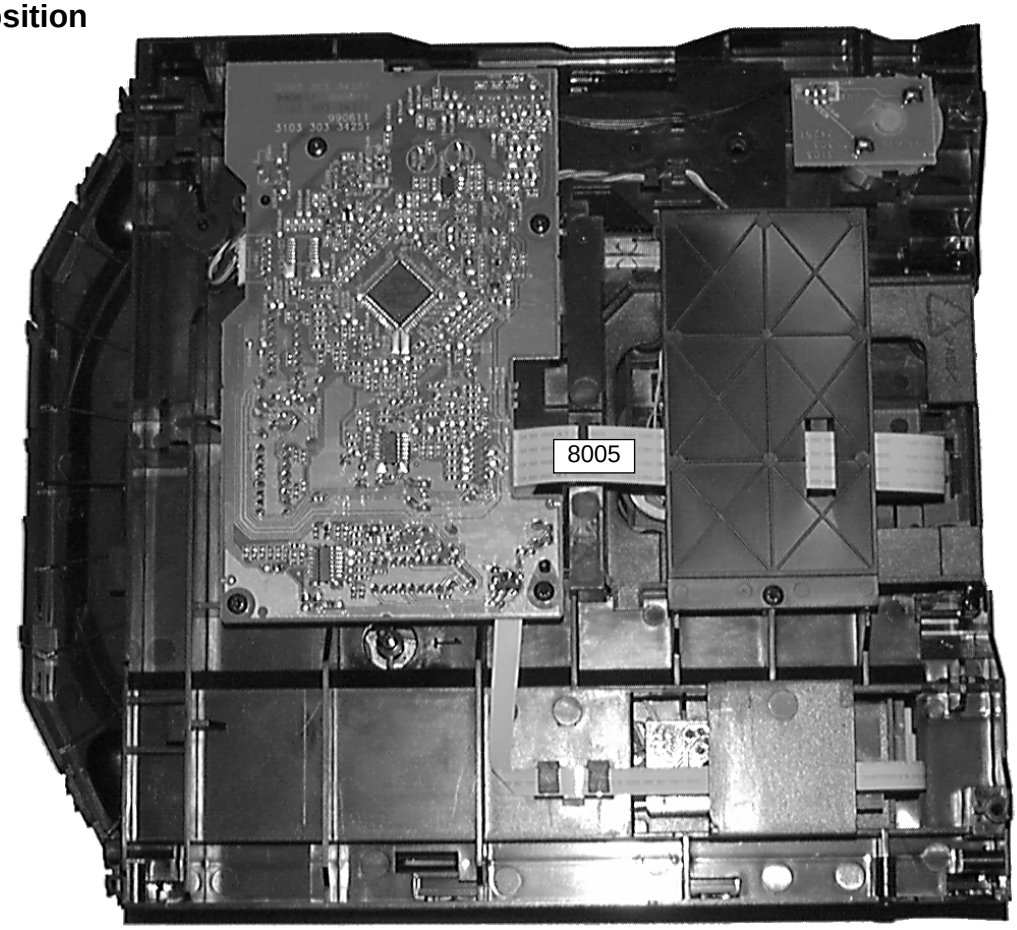
1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.



Wiring



Service Position



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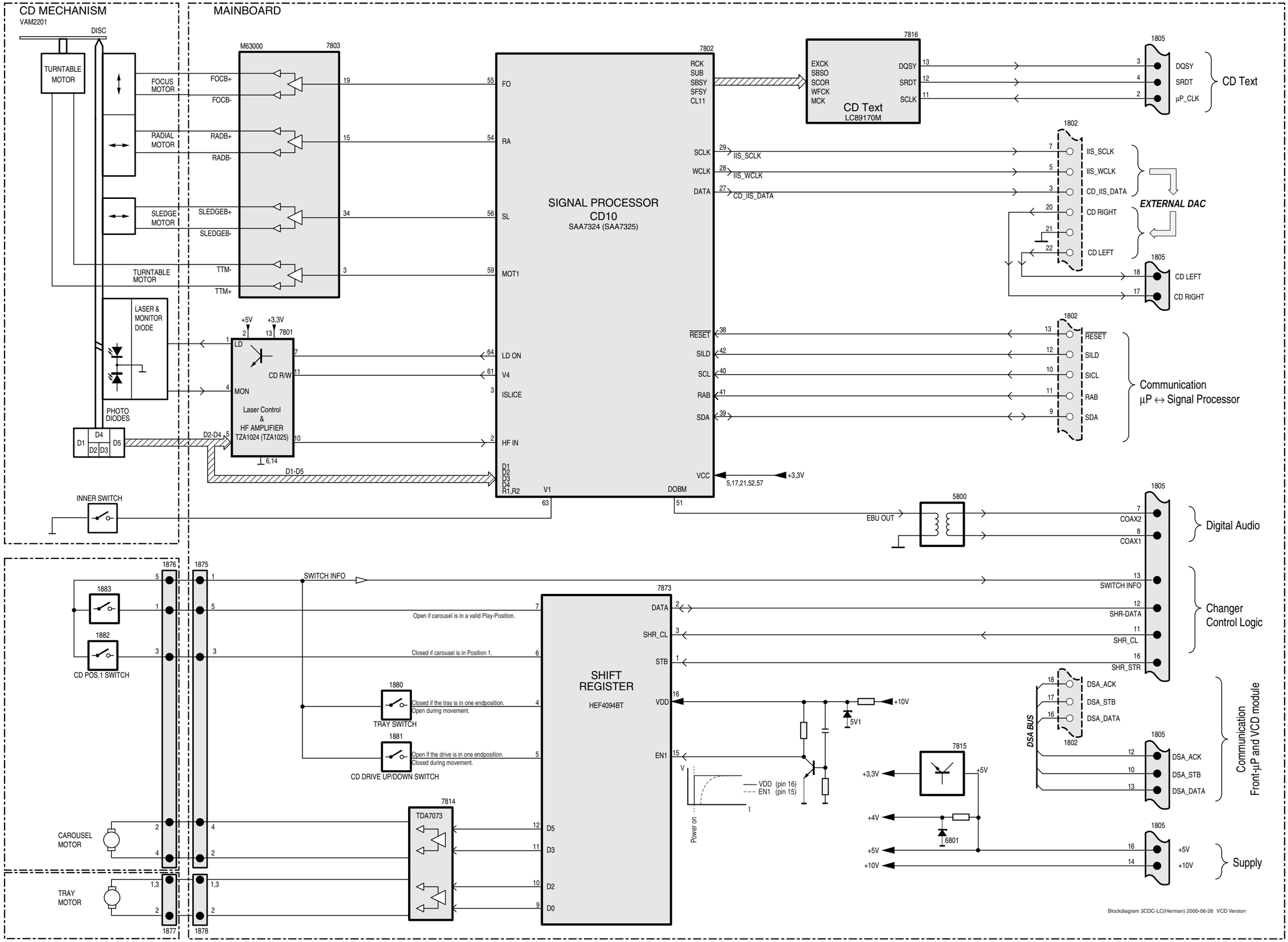
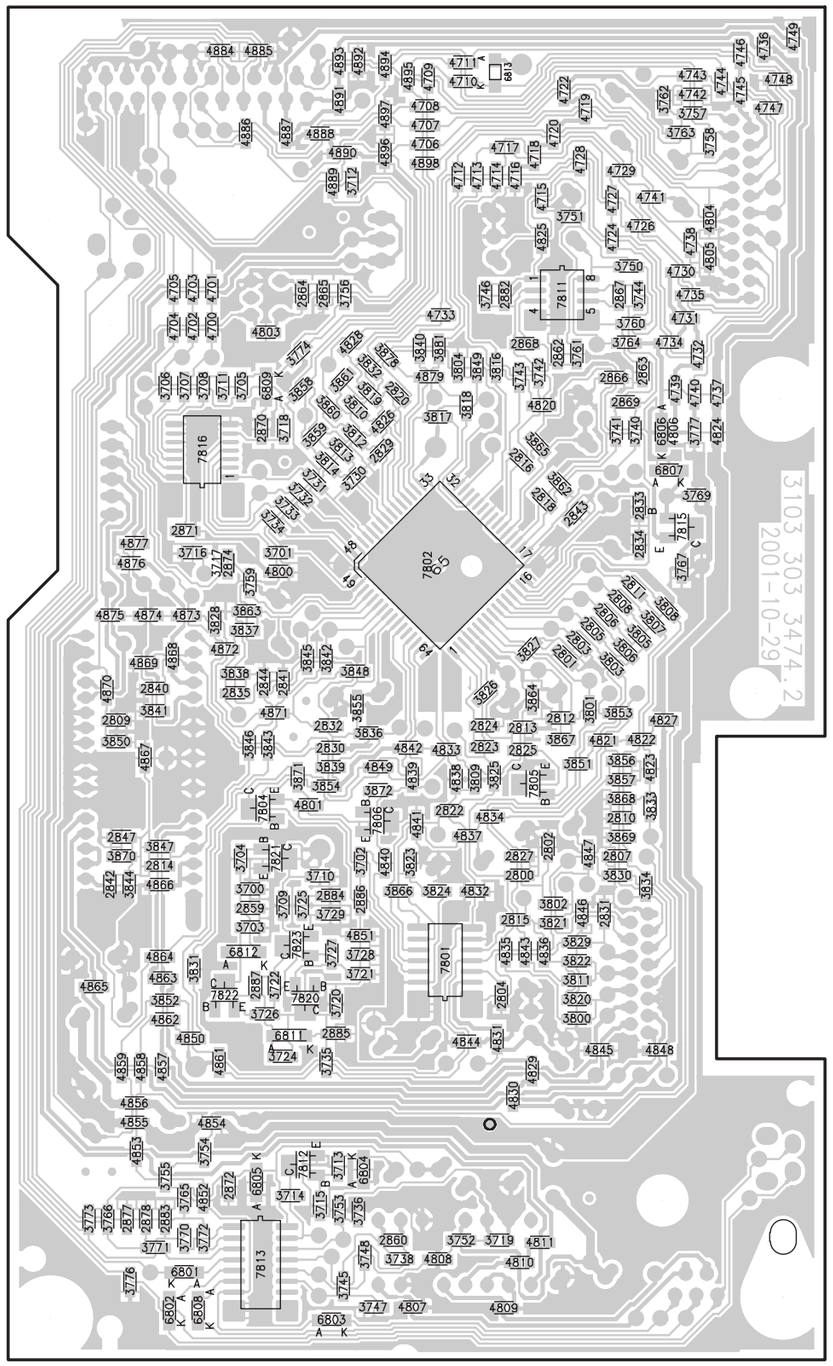
BLOCK DIAGRAM 3CDC-LC **VCD Version**



3CDC-LC (Herman) Copperside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

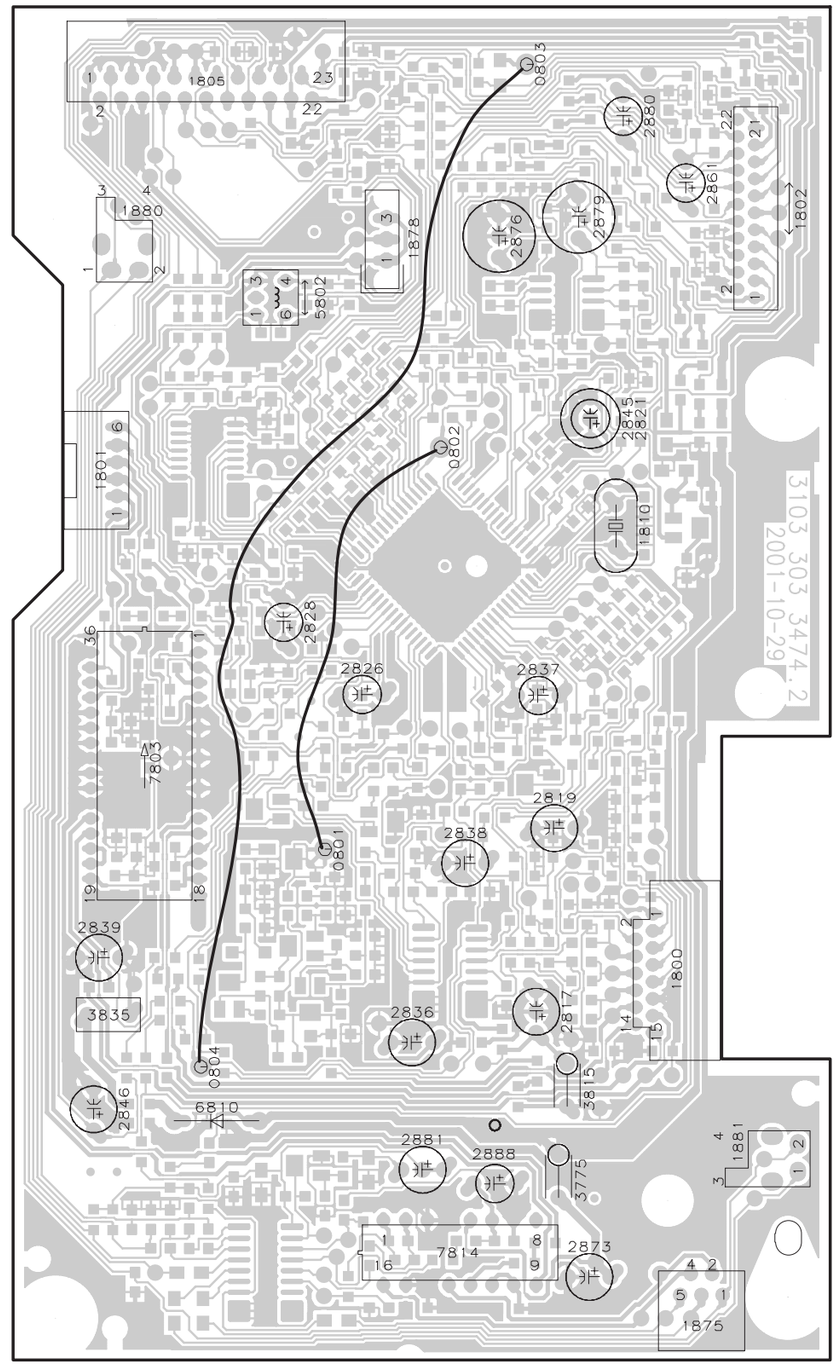
3CDC-LC VCD (Herman) Layout stage .2 2001-11-12

Mapping

Copperside								Componentside	
2800	F4	3732	C2	3851	E4	4828	C3	7823	F2
2801	D4	3733	C2	3852	F1	4829	G4		
2802	E4	3734	D2	3853	E4	4830	G3		
2803	D4	3735	G2	3854	E2	4831	G3		
2804	F3	3736	H3	3855	E3	4832	F3		
2805	D4	3738	H3	3856	E4	4833	E3		
2806	D4	3740	C4	3857	E4	4834	E3		
2807	F4	3741	C4	3858	C2	4835	F3		
2808	D4	3742	C4	3859	C2	4836	F4		
2809	E1	3743	C4	3860	C2	4837	E3		
2810	E4	3744	B4	3861	C2	4838	E3		
2811	D4	3745	H2	3862	C4	4839	E3		
2812	E4	3746	B3	3863	D2	4840	F3		
2813	E4	3747	H3	3864	E4	4841	E3		
2814	F1	3748	H3	3865	C4	4842	E3		
2815	F3	3750	B4	3866	F3	4843	F4		
2816	C4	3751	B4	3867	E4	4844	G3		
2818	C4	3752	H3	3868	E4	4845	G4		
2820	C3	3753	H2	3869	E4	4846	F4		
2822	E3	3754	G2	3870	F1	4847	F4		
2823	E3	3755	G1	3871	E2	4848	G4		
2824	E3	3756	B2	3872	E3	4849	E3		
2825	E4	3757	A5	3878	C3	4850	G2		
2827	F4	3758	A5	3881	C3	4851	F3		
2829	C3	3759	D2	4700	B2	4852	H2		
2830	E2	3760	B4	4701	B2	4853	G1		
2831	F4	3761	C4	4702	B2	4854	G2		
2832	E2	3762	A4	4703	B2	4855	G1		
2833	C4	3763	A4	4704	B1	4856	G1		
2834	D4	3764	C4	4705	B1	4857	G1		
2835	E2	3765	H2	4706	A3	4858	G1		
2840	E1	3766	H1	4707	A3	4859	G1		
2841	E2	3767	D4	4708	A3	4861	G2		
2842	F1	3769	C5	4709	A3	4862	F1		
2843	D4	3770	H2	4710	A3	4863	F1		
2844	E2	3771	H1	4711	A3	4864	F1		
2847	E1	3772	H2	4712	B3	4865	F1		
2859	F2	3773	H1	4713	B3	4866	F1		
2860	H3	3774	C2	4714	B3	4867	E1		
2862	C4	3776	H1	4715	B4	4868	D1		
2863	C4	3777	C5	4716	B3	4869	D1		
2864	B2	3800	F4	4717	A3	4870	E1		
2865	B2	3801	E4	4718	A4	4871	E2		
2866	C4	3802	F4	4719	A4	4872	D2		
2867	B4	3803	D4	4720	A4	4873	D2		
2868	C4	3804	C3	4722	A4	4874	D1		
2869	C4	3805	D4	4724	B4	4875	D1		
2870	C2	3806	D4	4726	B4	4876	D1		
2871	D2	3807	D4	4727	B4	4877	D1		
2872	G2	3808	D4	4728	A4	4879	C3		
2874	D2	3809	E3	4729	A4	4884	A2		
2877	H1	3810	C3	4730	B4	4885	A2		
2878	H1	3811	F4	4731	B4	4886	A2		
2882	B3	3812	C3	4732	C5	4887	A2		
2883	H1	3813	C2	4733	B3	4888	A2		
2884	F2	3814	C2	4734	C4	4889	B2		
2885	G2	3816	C3	4735	B5	4890	A2		
2886	F3	3817	C3	4736	A5	4891	A2		
2887	F2	3818	C3	4737	C5	4892	A3		
3700	F2	3819	C3	4738	B5	4893	A2		
3701	D2	3820	F4	4739	C4	4894	A3		
3702	F3	3821	F4	4740	C5	4895	A3		
3703	F2	3822	F4	4741	B4	4896	A3		
3704	F2	3823	F3	4742	A5	4897	A3		
3705	C2	3824	F3	4743	A5	4898	A3		
3706	C1	3825	E3	4744	A5	6801	H2		
3707	C2	3826	E3	4745	A5	6802	H1		
3708	C2	3827	D4	4746	A5	6803	H2		
3709	F2	3828	D2	4747	A5	6804	G3		
3710	F2	3829	F4	4748	A5	6805	G2		
3711	C2	3830	F4	4749	A5	6806	C4		
3712	B3	3831	F2	4800	D2	6807	C4		
3713	G2	3832	C3	4801	E2	6808	H2		
3714	H2	3833	E4	4803	B2	6809	C2		
3715	H2	3834	F4	4804	B5	6811	G2		
3716	D2	3836	E3	4805	B5	6812	F2		
3717	D2	3837	D2	4806	C4	6813	A3		
3718	C2	3838	D2	4807	H3	7801	F3		
3719	H3	3839	E2	4808	H3	7802	D3		
3720	F2	3840	C3	4809	H3	7804	E2		
3721	F3	3841	E1	4810	H4	7805	E4		
3722	F2	3842	D2	4811	H4	7806	E3		
3724	G2	3843	E2	4820	C4	7811	B4		
3725	F2	3844	F1	4821	E4	7812	G2		
3726	F2	3845	D2	4822	E4	7813	H2		
3727	F2	3846	E2	4823	E4	7815	D4		
3728	F3	3847	E1	4824	C5	7816	C2		
3729	F2	3848	D3	4825	B4	7820	F2		
3730	C3	3849	C3	4826	C3	7821	F2		
3731	C2	3850	E1	4827	E4	7822	F2		

10-6

3CDC-LC (Herman) Components seen from Copperside



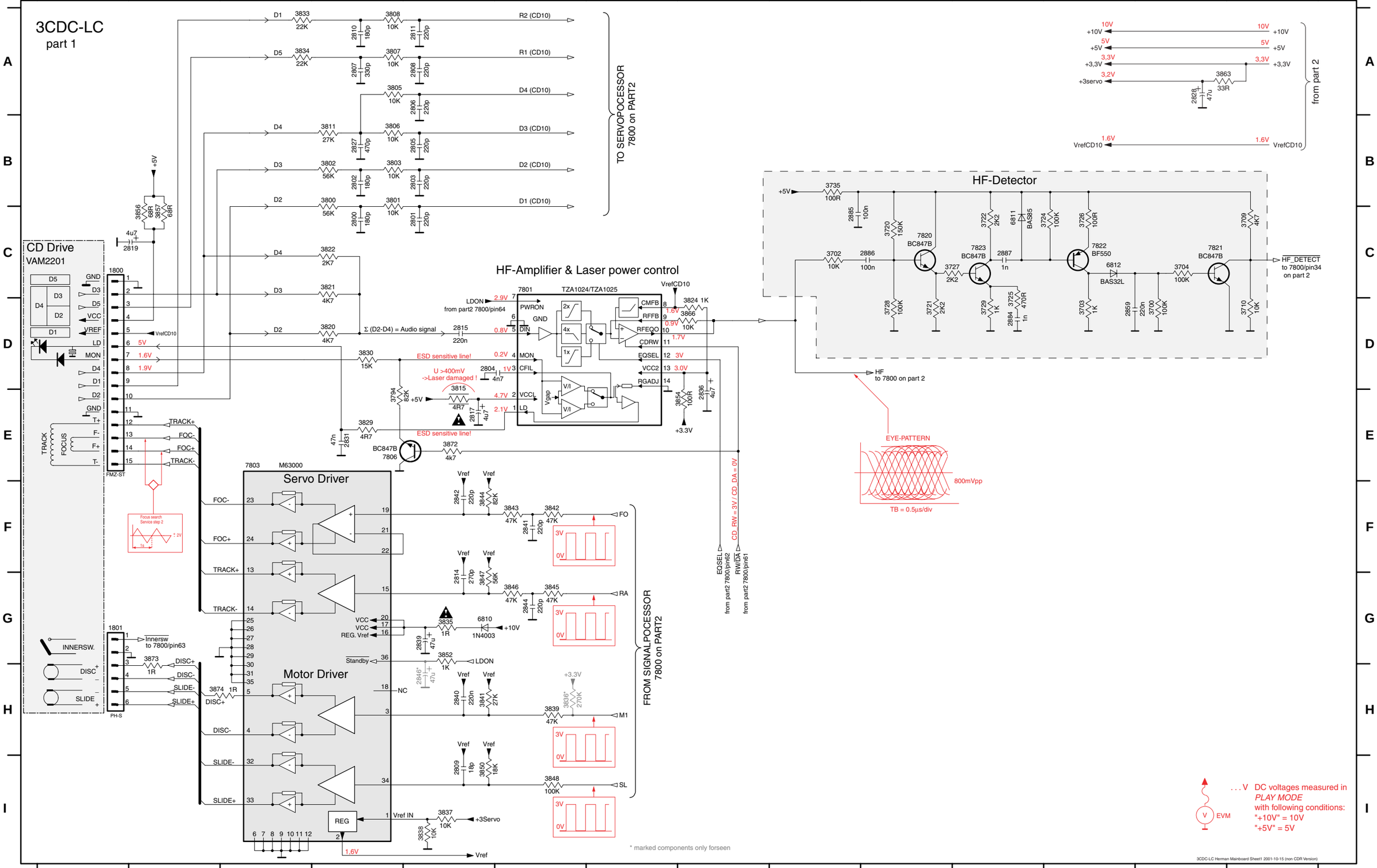
This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LC VCD (Herman) Layout stage .2 2001-11-12

10-7

1800	C1	2803	B5	2808	A5	2815	D5	2830	H6	2839	G5	2848	H5	2886	C10	3704	C13	3722	C11	3728	D10	3802	B4	3808	A4	3822	C4	3834	A3	3839	H6
1801	G1	2804	D6	2809	I5	2817	E5	2831	E4	2840	H5	2859	D13	2887	C11	3709	C14	3724	C12	3729	D11	3803	B4	3811	B4	3824	D8	3835	G5	3841	H5
2800	C4	2805	B5	2810	A4	2819	C2	2832	I6	2841	F6	2860	A9	3700	D13	3710	D14	3725	D11	3735	B9	3805	A4	3815	E5	3829	E4	3836	H6	3842	F6
2801	C5	2806	A5	2811	A5	2827	B4	2835	I5	2842	F5	2884	D11	3702	C9	3720	C10	3726	C12	3800	B4	3806	B4	3820	D4	3830	D4	3837	I5	3843	F6
2802	B4	2807	A4	2814	G5	2828	A13	2836	E8	2844	G6	2885	C9	3703	D12	3721	D10	3727	C11	3801	B4	3807	A4	3821	C4	3833	A3	3838	I5	3844	F5

3845	G6	3852	H5	3866	D8	3874	H2	7801	D6	7822	C12																				
3846	G6	3854	E8	3868	A4	3886	A10	7803	E3	7823	C13																				
3847	G5	3856	C2	3869	A4	4801	E8	7806	E5																						
3848	I6	3857	C2	3872	E5	6811	C11	7820	C10																						
3850	I5	3863	A13	3873	G2	6812	C12	7821	C13																						



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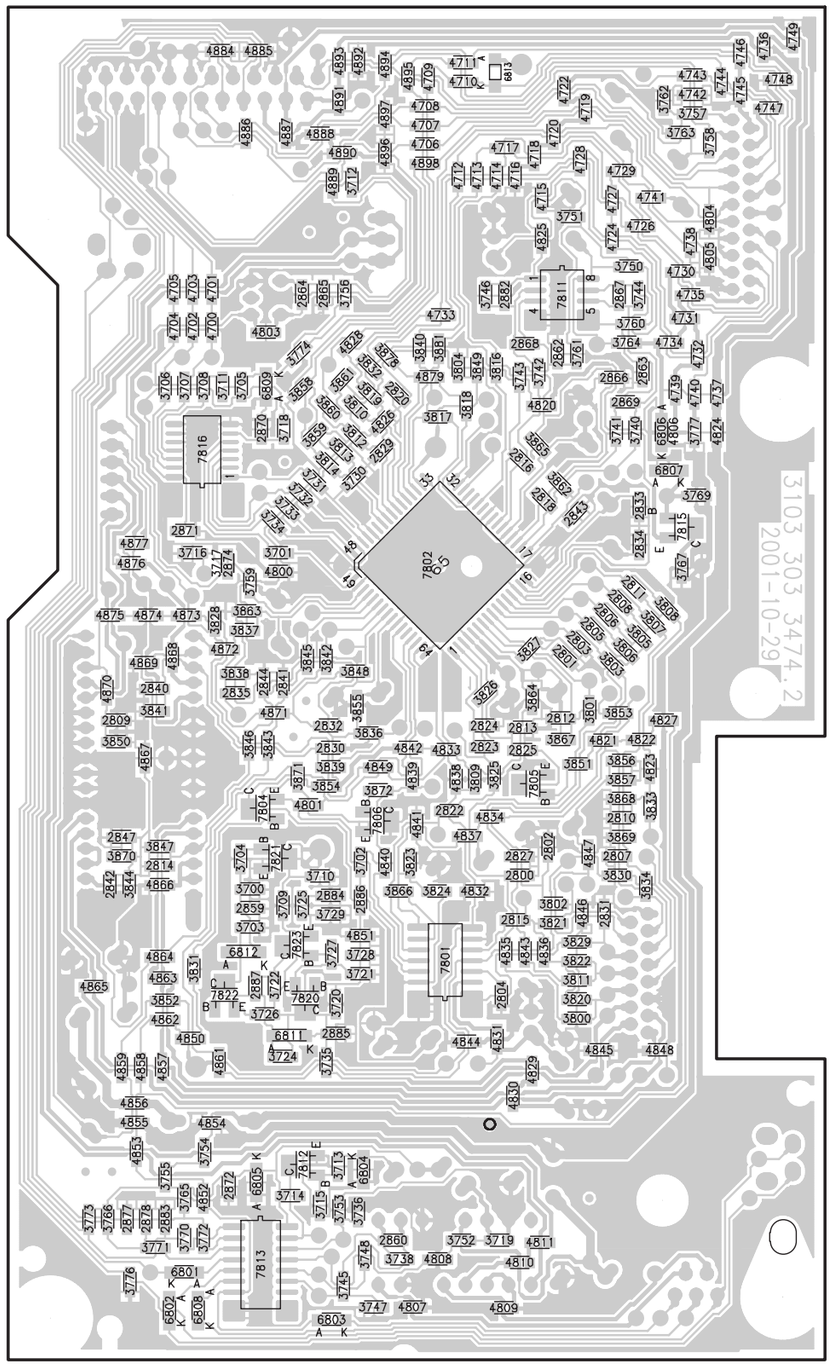
3CDC-LC (Herman) Copperside view



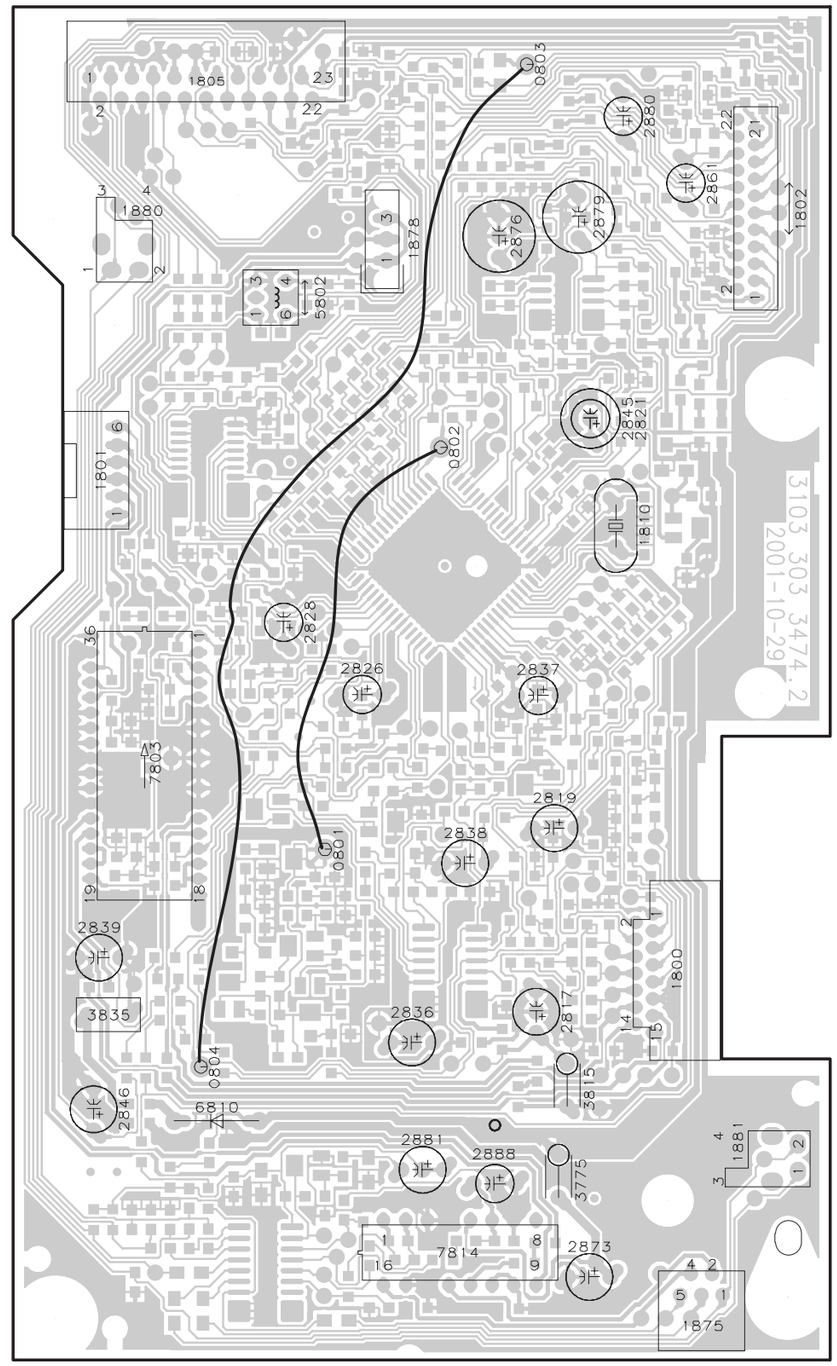
This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LC VCD (Herman) Layout stage .2 2001-11-12

Mapping

Copperside								Componentside	
2800	F4	3732	C2	3851	E4	4828	C3	7823	F2
2801	D4	3733	C2	3852	F1	4829	G4		
2802	E4	3734	D2	3853	E4	4830	G3		
2803	D4	3735	G2	3854	E2	4831	G3		
2804	F3	3736	H3	3855	E3	4832	F3		
2805	D4	3738	H3	3856	E4	4833	E3		
2806	D4	3740	C4	3857	E4	4834	E3		
2807	F4	3741	C4	3858	C2	4835	F3		
2808	D4	3742	C4	3859	C2	4836	F4		
2809	E1	3743	C4	3860	C2	4837	E3		
2810	E4	3744	B4	3861	C2	4838	E3		
2811	D4	3745	H2	3862	C4	4839	E3		
2812	E4	3746	B3	3863	D2	4840	F3		
2813	E4	3747	H3	3864	E4	4841	E3		
2814	F1	3748	H3	3865	C4	4842	E3		
2815	F3	3750	B4	3866	F3	4843	F4		
2816	C4	3751	B4	3867	E4	4844	G3		
2818	C4	3752	H3	3868	E4	4845	G4		
2820	C3	3753	H2	3869	E4	4846	F4		
2822	E3	3754	G2	3870	F1	4847	F4		
2823	E3	3755	G1	3871	E2	4848	G4		
2824	E3	3756	B2	3872	E3	4849	E3		
2825	E4	3757	A5	3878	C3	4850	G2		
2827	F4	3758	A5	3881	C3	4851	F3		
2829	C3	3759	D2	4700	B2	4852	H2		
2830	E2	3760	B4	4701	B2	4853	G1		
2831	F4	3761	C4	4702	B2	4854	G2		
2832	E2	3762	A4	4703	B2	4855	G1		
2833	C4	3763	A4	4704	B1	4856	G1		
2834	D4	3764	C4	4705	B1	4857	G1		
2835	E2	3765	H2	4706	A3	4858	G1		
2840	E1	3766	H1	4707	A3	4859	G1		
2841	E2	3767	D4	4708	A3	4861	G2		
2842	F1	3769	C5	4709	A3	4862	F1		
2843	D4	3770	H2	4710	A3	4863	F1		
2844	E2	3771	H1	4711	A3	4864	F1		
2847	E1	3772	H2	4712	B3	4865	F1		
2859	F2	3773	H1	4713	B3	4866	F1		
2860	H3	3774	C2	4714	B3	4867	E1		
2862	C4	3776	H1	4715	B4	4868	D1		
2863	C4	3777	C5	4716	B3	4869	D1		
2864	B2	3800	F4	4717	A3	4870	E1		
2865	B2	3801	E4	4718	A4	4871	E2		
2866	C4	3802	F4	4719	A4	4872	D2		
2867	B4	3803	D4	4720	A4	4873	D2		
2868	C4	3804	C3	4722	A4	4874	D1		
2869	C4	3805	D4	4724	B4	4875	D1		
2870	C2	3806	D4	4726	B4	4876	D1		
2871	D2	3807	D4	4727	B4	4877	D1		
2872	G2	3808	D4	4728	A4	4879	C3		
2874	D2	3809	E3	4729	A4	4884	A2		
2877	H1	3810	C3	4730	B4	4885	A2		
2878	H1	3811	F4	4731	B4	4886	A2		
2882	B3	3812	C3	4732	C5	4887	A2		
2883	H1	3813	C2	4733	B3	4888	A2		
2884	F2	3814	C2	4734	C4	4889	B2		
2885	G2	3816	C3	4735	B5	4890	A2		
2886	F3	3817	C3	4736	A5	4891	A2		
2887	F2	3818	C3	4737	C5	4892	A3		
3700	F2	3819	C3	4738	B5	4893	A2		
3701	D2	3820	F4	4739	C4	4894	A3		
3702	F3	3821	F4	4740	C5	4895	A3		
3703	F2	3822	F4	4741	B4	4896	A3		
3704	F2	3823	F3	4742	A5	4897	A3		
3705	C2	3824	F3	4743	A5	4898	A3		
3706	C1	3825	E3	4744	A5	6801	H2		
3707	C2	3826	E3	4745	A5	6802	H1		
3708	C2	3827	D4	4746	A5	6803	H2		
3709	F2	3828	D2	4747	A5	6804	G3		
3710	F2	3829	F4	4748	A5	6805	G2		
3711	C2	3830	F4	4749	A5	6806	C4		
3712	B3	3831	F2	4800	D2	6807	C4		
3713	G2	3832	C3	4801	E2	6808	H2		
3714	H2	3833	E4	4803	B2	6809	C2		
3715	H2	3834	F4	4804	B5	6811	G2		
3716	D2	3836	E3	4805	B5	6812	F2		
3717	D2	3837	D2	4806	C4	6813	A3		
3718	C2	3838	D2	4807	H3	7801	F3		
3719	H3	3839	E2	4808	H3	7802	D3		
3720	F2	3840	C3	4809	H3	7804	E2		
3721	F3	3841	E1	4810	H4	7805	E4		
3722	F2	3842	D2	4811	H4	7806	E3		
3724	G2	3843	E2	4820	C4	7811	B4		
3725	F2	3844	F1	4821	E4	7812	G2		
3726	F2	3845	D2	4822	E4	7813	H2		
3727	F2	3846	E2	4823	E4	7815	D4		
3728	F3	3847	E1	4824	C5	7816	C2		
3729	F2	3848	D3	4825	B4	7820	F2		
3730	C3	3849	C3	4826	C3	7821	F2		
3731	C2	3850	E1	4827	E4	7822	F2		
								0801	E2
								0802	C3
								0803	A4
								0804	G2
								1800	F4
								1801	C1
								1802	B5
								1805	A2
								1810	D4
								1875	H5
								1878	B3
								1880	B1
								1881	G5
								2817	F4
								2819	E4
								2821	C4
								2826	D3
								2828	D2
								2836	F3
								2837	D4
								2838	E3
								2839	F1
								2845	C4
								2846	G1
								2861	B5
								2873	H4
								2876	B3
								2879	B4
								2880	A4
								2881	G3
								2888	G3
								3775	G4
								3815	G4
								3835	F1
								5802	B2
								6810	G2
								7803	E1
								7814	H3

3CDC-LC (Herman) Components seen from Copperside



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LC VCD (Herman) Layout stage .2 2001-11-12

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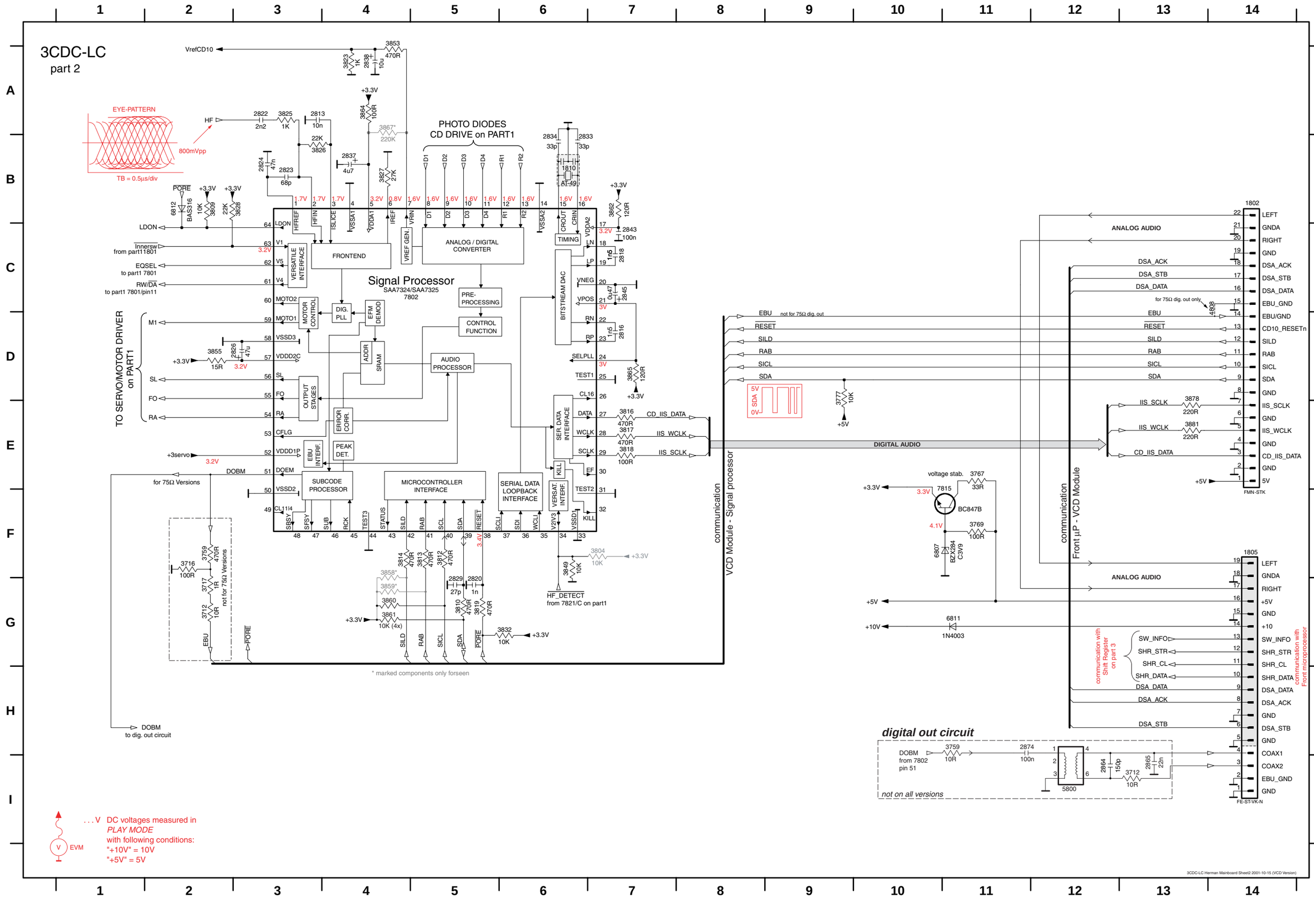
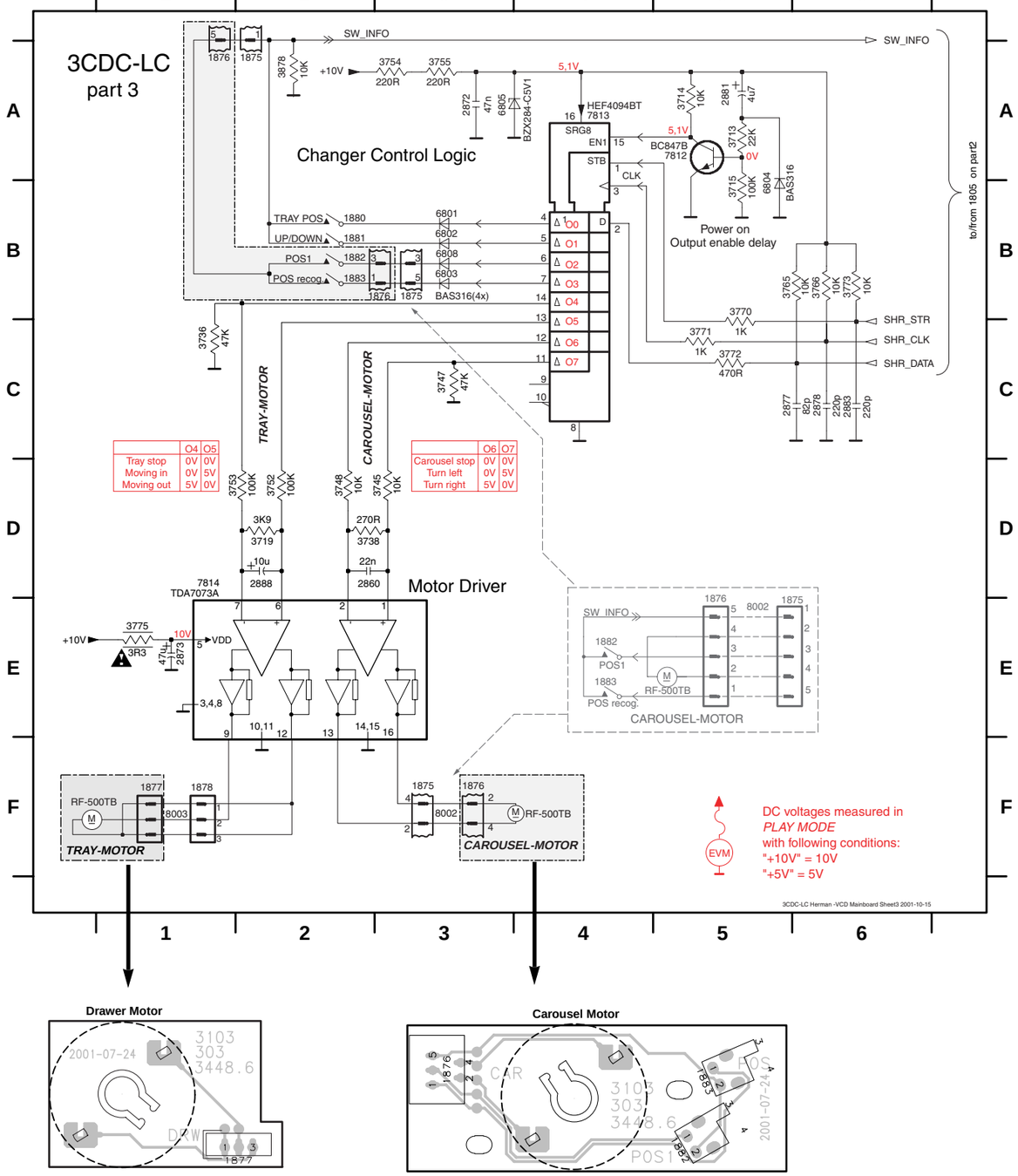
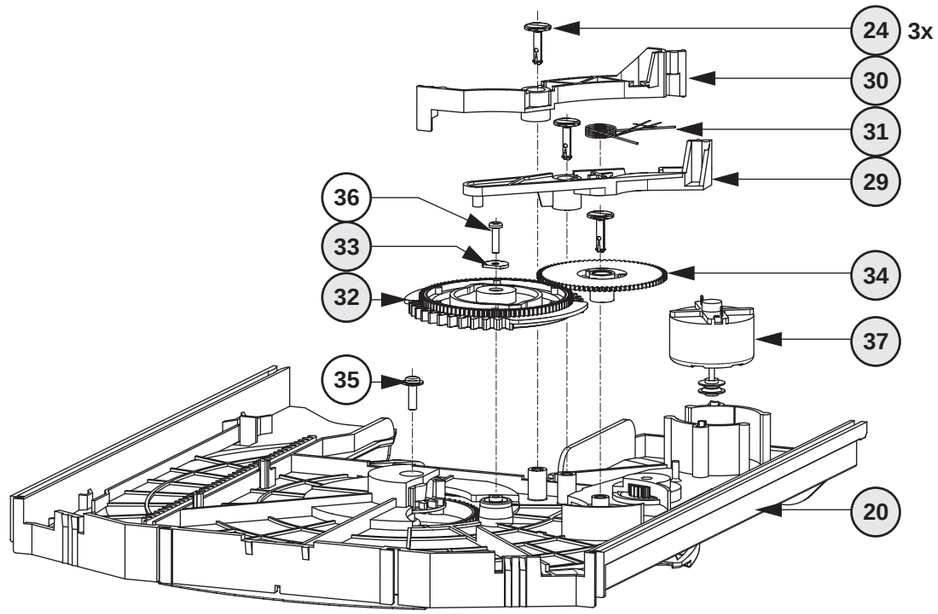
1802	B14	2816	D7	2823	B3	2833	B6	2843	C7	2870	I5	3705	H7	3712	G2	3718	H6	3733	I5	3767	E11	3804	F7	3812	F5	3817	E7	3825	A3	3832	G6	3858	G4	3862	B7	3878	E13	6807	F11	7802	C5
1805	F14	2818	C7	2824	B3	2834	B6	2845	C7	2871	H6	3706	I7	3712	I13	3730	I4	3734	I5	3769	F11	3808	I7	3813	F5	3818	E7	3826	B3	3849	F6	3859	G4	3864	A4	3881	E13	6809	H7	7815	F11
1810	B6	2820	G5	2826	D3	2837	B4	2854	I12	2874	H11	3707	I7	3716	F2	3731	I5	3759	F2	3774	H8	3809	B2	3814	F4	3819	G5	3827	B4	3853	A4	3860	G4	3865	D7	4808	C14	6811	G11	7816	I5
2813	A3	2822	A3	2829	G5	2838	A4	2865	I13	3701	I5	3711	I7	3717	G2	3732	I5	3759	H10	3777	D9	3810	G5	3816	E7	3823	A4	3828	B3	3855	D2	3861	G4	3867	A4	5800	I12	6812	B2		



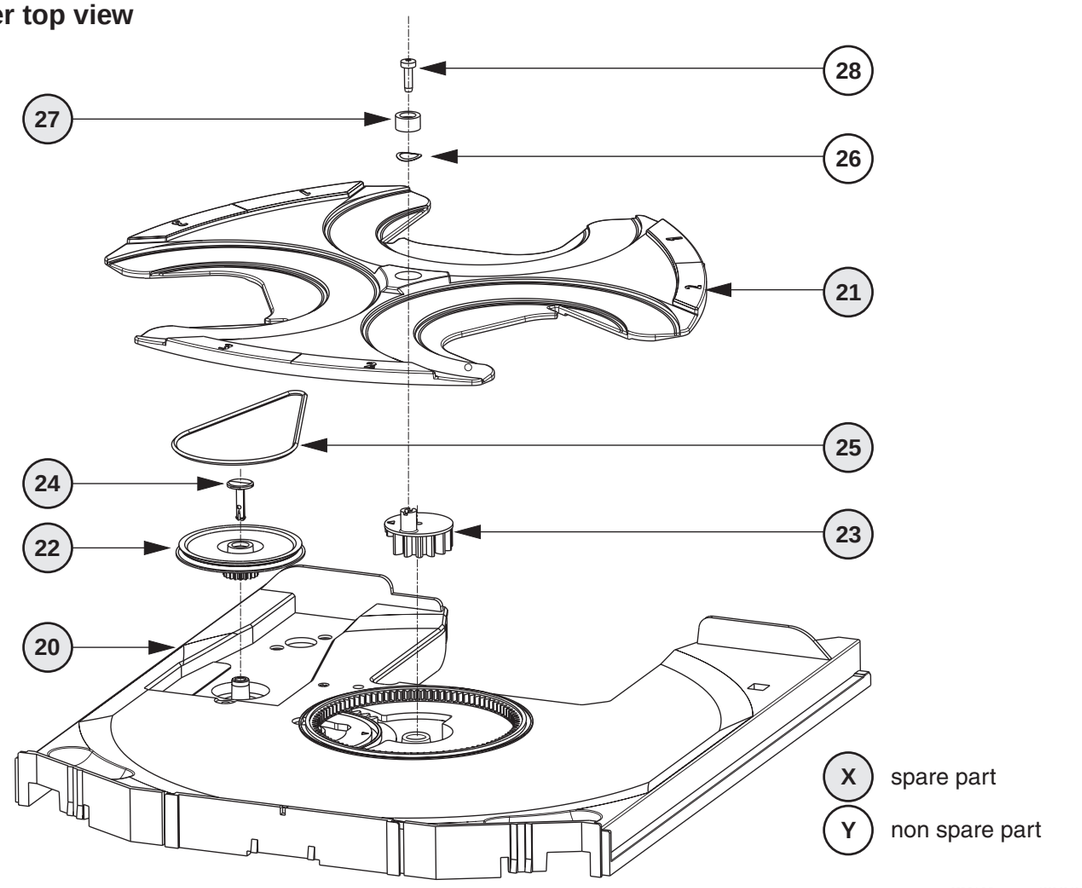
1875	F3	1876	B3	1880	B2	1883	E4	2878	C6	3714	A5	3745	D3	3754	A3	3771	C5	6801	B3	6808	B3	8003	F1
1875	E5	1876	F3	1881	B2	2860	D2	2881	A5	3715	B5	3747	C3	3755	A3	3772	C5	6802	B3	7812	A5		
1875	B3	1876	E5	1882	B2	2872	A3	2883	C6	3719	D2	3748	D2	3765	B6	3773	B6	6803	B3	7813	A4		
1875	A2	1877	F1	1882	E4	2873	E1	2888	D2	3736	C1	3752	D2	3766	B6	3775	E1	6804	B5	7814	E1		
1876	A1	1878	F1	1883	B2	2877	C6	3713	A5	3738	D2	3753	D2	3770	C5	3878	A2	6805	A4	8002	E5		



Drawer bottom view



Drawer top view



3CDC-LC Drawer assy 1999 09 13

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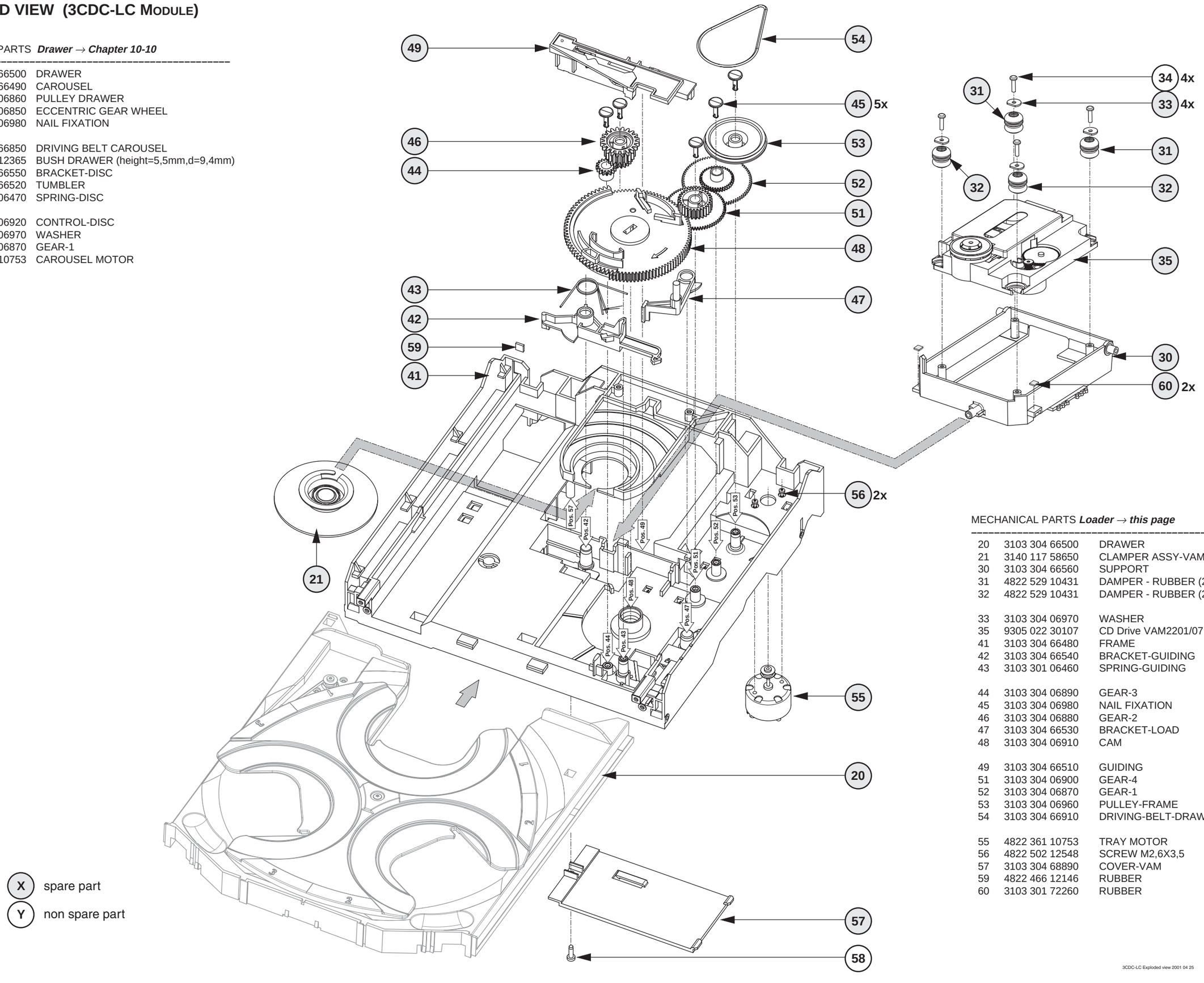
EXPLODED VIEW (3CDC-LC MODULE)

MECHANICAL PARTS ***Drawer → Chapter 10-10***

20	3103 304 66500	DRAWER
21	3103 304 66490	CAROUSEL
22	3103 304 06860	PULLEY DRAWER
23	3103 304 06850	ECCENTRIC GEAR WHEEL
24	3103 304 06980	NAIL FIXATION
25	3103 304 66850	DRIVING BELT CAROUSEL
27	4822 532 12365	BUSH DRAWER (height=5,5mm,d=9,4mm)
29	3103 304 66550	BRACKET-DISC
30	3103 304 66520	TUMBLER
31	3103 301 06470	SPRING-DISC
32	3103 304 06920	CONTROL-DISC
33	3103 304 06970	WASHER
34	3103 304 06870	GEAR-1
37	4822 361 10753	CAROUSEL MOTOR



X spare part

Y non spare part

MECHANICAL PARTS ***Loader → this page***

20	3103 304 66500	DRAWER
21	3140 117 58650	CLAMPER ASSY-VAM
30	3103 304 66560	SUPPORT
31	4822 529 10431	DAMPER - RUBBER (25DEG)
32	4822 529 10431	DAMPER - RUBBER (25DEG)
33	3103 304 06970	WASHER
35	9305 022 30107	CD Drive VAM2201/07
41	3103 304 66480	FRAME
42	3103 304 66540	BRACKET-GUIDING
43	3103 301 06460	SPRING-GUIDING
44	3103 304 06890	GEAR-3
45	3103 304 06980	NAIL FIXATION
46	3103 304 06880	GEAR-2
47	3103 304 66530	BRACKET-LOAD
48	3103 304 06910	CAM
49	3103 304 66510	GUIDING
51	3103 304 06900	GEAR-4
52	3103 304 06870	GEAR-1
53	3103 304 06960	PULLEY-FRAME
54	3103 304 66910	DRIVING-BELT-DRAWER
55	4822 361 10753	TRAY MOTOR
56	4822 502 12548	SCREW M2,6X3,5
57	3103 304 68890	COVER-VAM
59	4822 466 12146	RUBBER
60	3103 301 72260	RUBBER

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ELECTRICAL PARTSLIST 3CDC-LC-VCD MODULE

MISCELLANEOUS

35	9305 022 30107	CD Drive VAM2201/07	
37	4822 361 10753	CAROUSEL MOTOR	
55	4822 361 10753	TRAY MOTOR	
1800	4822 265 10925	FLEX FOIL CONNECTOR 15P	
1802	2422 025 16837	FLEX FOIL CONNECTOR 22P	
1805	4822 265 10979	FLEX FOIL CONNECTOR 15P	
1805	4822 265 11545	FLEX FOIL CONNECTOR 19P	for digital out
1875	4822 267 10958	FLEX FOIL CONNECTOR 5P	
1876	2422 025 08332	FLEX FOIL CONNECTOR 5P	
1880	4822 276 13503	SWITCH, Tray position	
1881	4822 276 13503	SWITCH, Drive up/down	
1882	4822 276 13503	SWITCH, Position 1 recognized	
1883	4822 276 13503	SWITCH, valid position recognized	
8002	3103 308 91990	FLEX FOIL CABLE 5P, 200mm	
8005	3103 308 91980	FLEX FOIL CABLE 15P, 170mm	

CAPACITORS

2800 ©	4822 126 10326	180pF	5%	50V
2801 ©	4822 126 13883	220pF	5%	50V
2802 ©	4822 126 14508	180pF	5%	50V
2803 ©	4822 126 13883	220pF	5%	50V
2804 ©	4822 126 13193	4,7nF	10%	63V
2805 ©	4822 126 13883	220pF	5%	50V
2806 ©	4822 126 13883	220pF	5%	50V
2807 ©	5322 122 31863	330pF	5%	50V
2808 ©	4822 126 13883	220pF	5%	50V
2809 ©	4822 126 13879	220nF	20%	16V
2810 ©	4822 126 10326	180pF	5%	50V
2811 ©	4822 126 13883	220pF	5%	50V
2812 ©	3198 017 34730	47nF	10%	16V
2813 ©	4822 122 33177	10nF	20%	50V
2814 ©	4822 122 33216	270pF	5%	50V
2815 ©	4822 126 14076	220nF	20%	25V
2816 ©	4822 126 13344	1,5nF	5%	63V
2817	4822 124 40769	4,7µF	20%	100V
2818 ©	4822 126 13344	1,5nF	5%	63V
2819	4822 124 40769	4,7µF	20%	100V
2820 ©	5322 126 11578	1nF	10%	63V
2822 ©	2238 786 11554	2,2nF	5%	16V
2823 ©	4822 126 13956	68pF	5%	63V
2824 ©	4822 126 13751	47nF	10%	50V
2826	4822 124 12362	47µF	20%	4V
2827 ©	5322 122 34099	470pF	10%	63V
2828	4822 124 12362	47µF	20%	4V
2829 ©	4822 126 11669	27pF	10%	50V
2831 ©	4822 126 13751	47nF	10%	50V
2833 ©	4822 126 11671	33pF	5%	50V
2834 ©	4822 126 11671	33pF	5%	50V
2835 ©	3198 017 34730	47nF	10%	16V
2836	4822 124 40769	4,7µF	20%	100V
2837	4822 124 22726	4,7µF	20%	35V
2839	4822 124 40433	47µF	20%	25V
2840 ©	4822 126 13751	47nF	10%	50V
2841 ©	4822 122 33575	220pF	5%	50V
2842 ©	4822 126 13883	220pF	5%	50V
2843 ©	4822 126 14585	100nF	10%	50V
2844 ©	5322 126 10794	220pF	10%	50V
2845	5322 124 41948	0,47µF	20%	50V
2846	5322 124 41948	0,47µF	20%	50V
2859 ©	4822 126 14076	220nF	20%	25V
2860 ©	4822 126 14494	22nF	10%	25V
2864 ©	5322 122 33538	150pF	5%	63V
2865 ©	5322 122 32654	22nF	10%	63V
2866 ©	4822 126 13751	47nF	10%	50V
2872 ©	3198 017 34730	47nF	10%	16V
2873	4822 124 80231	47µF	20%	16V
2874 ©	4822 126 14305	100nF	10%	16V

CAPACITORS

2877 ©	4822 126 14226	82pF		50V
2878 ©	4822 126 13883	220pF	5%	50V
2881	4822 124 40769	4,7µF	20%	100V
2883 ©	4822 126 13883	220pF	5%	50V
2884 ©	5322 126 11578	1nF	10%	63V
2885 ©	4822 126 14585	100nF	10%	50V
2886 ©	4822 126 14585	100nF	10%	50V
2887 ©	5322 126 11578	1nF	10%	63V
2888	4822 124 11947	10µF	20%	16V

RESISTORS

3700 ©	4822 117 10837	100kΩ	1%	0,1W
3702 ©	4822 117 10833	10kΩ	1%	0,1W
3703 ©	4822 051 10102	1kΩ	2%	0,25W
3704 ©	4822 117 10837	100kΩ	1%	0,1W
3709 ©	4822 051 20472	4,7kΩ	5%	0,1W
3710 ©	4822 117 10833	10kΩ	1%	0,1W
3712 ©	4822 051 30109	10Ω	5%	0,06W
3713 ©	4822 051 30223	22kΩ	5%	0,06W
3714 ©	4822 051 30103	10kΩ	5%	0,06W
3715 ©	4822 117 13632	100kΩ	1%	0,06W
3716 ©	4822 051 30101	100Ω	5%	0,06W
3717 ©	4822 117 12917	1Ω	5%	0,06W
3719 ©	4822 051 30392	3,9kΩ	5%	0,06W
3720 ©	4822 051 20154	150kΩ	5%	0,1W
3721 ©	4822 117 11449	2,2kΩ	1%	0,1W
3722 ©	4822 117 11449	2,2kΩ	1%	0,1W
3724 ©	4822 117 10837	100kΩ	1%	0,1W
3725 ©	4822 051 20471	470Ω	5%	0,1W
3726 ©	4822 117 11373	100Ω	1%	0,1W
3727 ©	4822 117 11449	2,2kΩ	1%	0,1W
3728 ©	4822 117 10837	100kΩ	1%	0,1W
3729 ©	4822 051 20471	470Ω	5%	0,1W
3730 ©	4822 051 20333	33kΩ	5%	0,1W
3735 ©	4822 117 11373	100Ω	1%	0,1W
3736 ©	4822 117 12925	47kΩ	1%	0,06W
3738 ©	4822 051 30271	270Ω	5%	0,06W
3745 ©	4822 117 10833	10kΩ	1%	0,1W
3747 ©	4822 117 12925	47kΩ	1%	0,06W
3748 ©	4822 051 30103	10kΩ	5%	0,06W
3752 ©	4822 117 13632	100kΩ	1%	0,06W
3753 ©	4822 117 13632	100kΩ	1%	0,06W
3754 ©	4822 117 11503	220Ω	5%	0,1W
3755 ©	4822 117 11503	220Ω	5%	0,1W
3759 ©	4822 051 20109	10Ω	5%	0,1W
3765 ©	4822 051 30103	10kΩ	5%	0,06W
3766 ©	4822 117 10833	10kΩ	1%	0,1W
3767 ©	4822 051 30339	33Ω	5%	0,06W
3769 ©	4822 051 30101	100Ω	5%	0,06W
3770 ©	4822 051 30102	1kΩ	5%	0,06W
3771 ©	4822 051 30102	1kΩ	5%	0,06W
3772 ©	4822 051 30471	470Ω	5%	0,06W
3773 ©	4822 117 10833	10kΩ	1%	0,1W
3775 ⚠	4822 052 10338	3,3Ω	5%	NFR25
3776 ©	4822 051 30103	10kΩ	5%	0,06W
3777 ©	4822 051 30103	10kΩ	5%	0,06W
3800 ©	4822 051 30563	56kΩ	5%	0,06W
3801 ©	4822 051 30103	10kΩ	5%	0,06W
3802 ©	4822 117 11148	56kΩ	1%	0,1W
3803 ©	4822 117 10833	10kΩ	1%	0,1W
3804 ©	4822 051 30103	10kΩ	5%	0,06W
3805 ©	4822 051 30103	10kΩ	5%	0,06W
3806 ©	4822 051 30103	10kΩ	5%	0,06W
3807 ©	4822 051 30103	10kΩ	5%	0,06W
3808 ©	4822 051 30103	10kΩ	5%	0,06W
3809 ©	4822 051 30103	10kΩ	5%	0,06W

RESISTORS

3810 ©	4822 051 30471	470Ω	5%	0,06W
3811 ©	4822 051 20273	27kΩ	5%	0,1W
3812 ©	4822 051 20471	470Ω	5%	0,1W
3813 ©	4822 051 20471	470Ω	5%	0,1W
3814 ©	4822 051 20471	470Ω	5%	0,1W
3815 ⚠	4822 052 10478	4,7Ω	5%	NFR25
3816 ©	4822 051 20471	470Ω	5%	0,1W
3817 ©	4822 051 30471	470Ω	5%	0,06W
3818 ©	4822 051 30101	100Ω	5%	0,06W
3818 ©	4822 051 30471	470Ω	5%	0,06W
3819 ©	4822 051 20471	470Ω	5%	0,1W
3820 ©	4822 051 30472	4,7kΩ	5%	0,06W
3821 ©	4822 051 20472	4,7kΩ	5%	0,1W
3822 ©	4822 051 30272	2,7kΩ	5%	0,06W
3823 ©	4822 051 30102	1kΩ	5%	0,06W
3824 ©	4822 051 30102	1kΩ	5%	0,06W
3825 ©	4822 051 10102	1kΩ	2%	0,25W
3826 ©	4822 051 20223	22kΩ	5%	0,1W
3827 ©	4822 051 20273	27kΩ	5%	0,1W
3828 ©	4822 051 30223	22kΩ	5%	0,06W
3829 ©	4822 117 13608	4,7Ω	5%	0,06W
3830 ©	4822 116 83933	15kΩ	1%	0,1W
3832 ©	4822 117 10833	10kΩ	1%	0,1W
3833 ©	4822 051 30223	22kΩ	5%	0,06W
3834 ©	4822 051 20223	22kΩ	5%	0,1W
3835 ⚠	4822 052 10108	1Ω	5%	0,33W
3837 ©	4822 117 10833	10kΩ	1%	0,1W
3838 ©	4822 051 30103	10kΩ	5%	0,06W
3839 ©	4822 051 20273	27kΩ	5%	0,1W
3841 ©	4822 051 20273	27kΩ	5%	0,1W
3842 ©	4822 117 10834	47kΩ	1%	0,1W
3843 ©	4822 117 10834	47kΩ	1%	0,1W
3844 ©	4822 117 12864	82kΩ	5%	0,6W
3845 ©	4822 117 10834	47kΩ	1%	0,1W
3846 ©	4822 117 10834	47kΩ	1%	0,1W
3847 ©	4822 117 11148	56kΩ	1%	0,1W
3848 ©	4822 117 10837	100kΩ	1%	0,1W
3850 ©	4822 051 30183	18kΩ	5%	0,06W
3852 ©	4822 051 10102	1kΩ	2%	0,25W
3853 ©	4822 051 20471	470Ω	5%	0,1W
3854 ©	4822 051 30101	100Ω	5%	0,06W
3855 ©	4822 117 12971	15Ω	5%	0,06W
3856 ©	4822 117 12521	68Ω	1%	0,1W
3857 ©	4822 117 12521	68Ω	1%	0,1W
3860 ©	4822 117 10833	10kΩ	1%	0,1W
3862 ©	4822 051 20121	120Ω	5%	0,1W
3863 ©	4822 051 30339	33Ω	5%	0,06W
3864 ©	4822 051 30101	100Ω	5%	0,06W
3865 ©	4822 051 30121	120Ω	5%	0,06W
3866 ©	4822 051 30103	10kΩ	5%	0,06W
3871 ©	4822 117 11149	82kΩ	1%	0,1W
3872 ©	4822 051 20472	4,7kΩ	5%	0,1W
3878 ©	4822 117 11503	220Ω	5%	0,1W
3881 ©	4822 117 11503	220Ω	5%	0,1W
4707 ©	4822 051 20008	CHIP JUMPER 0805		
4708 ©	4822 051 20008	CHIP JUMPER 0805		
4709 ©	4822 051 20008	CHIP JUMPER 0805		
4710 ©	4822 051 20008	CHIP JUMPER 0805		
4711 ©	4822 051 20008	CHIP JUMPER 0805		
4713 ©	4822 051 20008	CHIP JUMPER 0805		
4714 ©	4822 051 20008	CHIP JUMPER 0805		
4717 ©	4822 051 30008	CHIP JUMPER 0603		
4724 ©	4822 051 20008	CHIP JUMPER 0805		
4726 ©	4822 051 20008	CHIP JUMPER 0805		
4727 ©	4822 051 20008	CHIP JUMPER 0805		

RESISTORS

4728 ©	4822 051 20008	CHIP JUMPER 0805
4729 ©	4822 051 20008	CHIP JUMPER 0805
4730 ©	4822 051 20008	CHIP JUMPER 0805
4731 ©	4822 051 30008	CHIP JUMPER 0603
4732 ©	4822 051 20008	CHIP JUMPER 0805
4733 ©	4822 051 30008	CHIP JUMPER 0603
4734 ©	4822 051 20008	CHIP JUMPER 0805
4735 ©	4822 051 20008	CHIP JUMPER 0805
4736 ©	4822 051 30008	CHIP JUMPER 0603
4737 ©	4822 051 30008	CHIP JUMPER 0603
4738 ©	4822 051 30008	CHIP JUMPER 0603
4739 ©	4822 051 30008	CHIP JUMPER 0603
4740 ©	4822 051 30008	CHIP JUMPER 0603
4743 ©	4822 051 20008	CHIP JUMPER 0805
4744 ©	4822 051 30008	CHIP JUMPER 0603
4745 ©	4822 051 20008	CHIP JUMPER 0805
4746 ©	4822 051 20008	CHIP JUMPER 0805
4747 ©	4822 051 20008	CHIP JUMPER 0805
4748 ©	4822 051 20008	CHIP JUMPER 0805
4749 ©	4822 051 30008	CHIP JUMPER 0603
4800 ©	4822 051 30008	CHIP JUMPER 0603
4801 ©	4822 051 30008	CHIP JUMPER 0603
4803 ©	4822 051 30008	CHIP JUMPER 0603
4804 ©	4822 051 20008	CHIP JUMPER 0805
4805 ©	4822 051 30008	CHIP JUMPER 0603
4806 ©	4822 051 20008	CHIP JUMPER 0805
4820 ©	4822 051 20008	CHIP JUMPER 0805
4823 ©	4822 051 30008	CHIP JUMPER 0603
4824 ©	4822 051 30008	CHIP JUMPER 0603
4826 ©	4822 051 20008	CHIP JUMPER 0805
4828 ©	4822 051 30008	CHIP JUMPER 0603
4829 ©	4822 051 20008	CHIP JUMPER 0805
4830 ©	4822 051 20008	CHIP JUMPER 0805
4831 ©	4822 051 20008	CHIP JUMPER 0805
4832 ©	4822 051 30008	CHIP JUMPER 0603
4833 ©	4822 051 20008	CHIP JUMPER 0805
4834 ©	4822 051 20008	CHIP JUMPER 0805
4835 ©	4822 051 20008	CHIP JUMPER 0805
4836 ©	4822 051 20008	CHIP JUMPER 0805
4837 ©	4822 051 20008	CHIP JUMPER 0805
4838 ©	4822 051 30008	CHIP JUMPER 0603
4839 ©	4822 051 20008	CHIP JUMPER 0805
4840 ©	4822 051 20008	CHIP JUMPER 0805
4841 ©	4822 051 20008	CHIP JUMPER 0805
4842 ©	4822 051 20008	CHIP JUMPER 0805
4843 ©	4822 051 20008	CHIP JUMPER 0805
4844 ©	4822 051 20008	CHIP JUMPER 0805
4845 ©	4822 051 20008	CHIP JUMPER 0805
4846 ©	4822 051 20008	CHIP JUMPER 0805
4847 ©	4822 051 20008	CHIP JUMPER 0805
4848 ©	4822 051 20008	CHIP JUMPER 0805
4849 ©	4822 051 30008	CHIP JUMPER 0603
4850 ©	4822 051 20008	CHIP JUMPER 0805
4851 ©	4822 051 20008	CHIP JUMPER 0805
4854 ©	4822 051 30008	CHIP JUMPER 0603
4855 ©	4822 051 20008	CHIP JUMPER 0805
4856 ©	4822 051 20008	CHIP JUMPER 0805
4857 ©	4822 051 30008	CHIP JUMPER 0603
4859 ©	4822 051 20008	CHIP JUMPER 0805
4861 ©	4822 051 20008	CHIP JUMPER 0805
4863 ©	4822 051 20008	CHIP JUMPER 0805
4864 ©	4822 051 20008	CHIP JUMPER 0805
4865 ©	4822 051 30008	CHIP JUMPER 0603
4866 ©	4822 051 20008	CHIP JUMPER 0805
4867 ©	4822 051 30008	CHIP JUMPER 0603

ELECTRICAL PARTSLIST 3CDC-LC-VCD MODULE

RESISTORS

4868	©	4822 051 20008	CHIP JUMPER 0805
4869	©	4822 051 20008	CHIP JUMPER 0805
4870	©	4822 051 20008	CHIP JUMPER 0805
4871	©	4822 051 20008	CHIP JUMPER 0805
4872	©	4822 051 20008	CHIP JUMPER 0805
4873	©	4822 051 20008	CHIP JUMPER 0805
4874	©	4822 051 20008	CHIP JUMPER 0805
4875	©	4822 051 20008	CHIP JUMPER 0805
4876	©	4822 051 20008	CHIP JUMPER 0805
4877	©	4822 051 30008	CHIP JUMPER 0603
4879	©	4822 051 20008	CHIP JUMPER 0805
4884	©	4822 051 20008	CHIP JUMPER 0805
4885	©	4822 051 20008	CHIP JUMPER 0805
4886	©	4822 051 20008	CHIP JUMPER 0805
4887	©	4822 051 30008	CHIP JUMPER 0603
4888	©	4822 051 20008	CHIP JUMPER 0805
4889	©	4822 051 20008	CHIP JUMPER 0805
4890	©	4822 051 20008	CHIP JUMPER 0805
4891	©	4822 051 30008	CHIP JUMPER 0603
4892	©	4822 051 20008	CHIP JUMPER 0805
4893	©	4822 051 20008	CHIP JUMPER 0805
4894	©	4822 051 20008	CHIP JUMPER 0805
4895	©	4822 051 20008	CHIP JUMPER 0805
4896	©	4822 051 20008	CHIP JUMPER 0805
4897	©	4822 051 20008	CHIP JUMPER 0805
4898	©	4822 051 20008	CHIP JUMPER 0805

COILS

1810	4822 242 10849	CRYSTAL 8,46MHz
5802	2422 536 00019	TRANSFORMER, DIGITAL OUT

DIODES

6801	©	4822 130 11397	BAS316
6802	©	4822 130 11397	BAS316
6803	©	4822 130 11397	BAS316
6804	©	4822 130 11397	BAS316
6805	©	4822 130 11383	BZX284-C5V1
6807	©	4822 130 11366	BZX284-C3V9
6808	©	4822 130 11397	BAS316
6810		4822 130 31878	1N4003G
6811	©	4822 130 82334	BAS85
6812	©	4822 130 80446	BAS32L
6813	©	4822 130 11397	BAS316

TRANSISTORS

7806	©	4822 130 60511	BC847B
7812	©	4822 130 60511	BC847B
7815	©	4822 130 60511	BC847B
7820	©	4822 130 60511	BC847B
7821	©	4822 130 60511	BC847B
7822		4822 130 42131	BF550
7823	©	4822 130 60511	BC847B

INTEGRATED CIRCUITS

7801	©	9352 622 36118	TZA1025T/V2 HF-Amplifier
7802	©	9352 641 81557	SAA7327M2B Signal processor
7803	©	9322 158 56682	M63000SP, MOTOR DRIVER
7813	©	5322 209 11306	HEF4094BT, SHIFT REGISTER
7814		4822 209 32852	TDA7073A/N2

COMBI BOARD

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11-1

Brief introduction of the Combi Board

A. TRANSFORMER PRIMARY PART
Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

B. POWER SUPPLY PART
Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +LED, +12A, +12M, -32V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

C. SOURCE SELECT & AMPLIFIER PART

a) SHIFT REGISTER (AF CONTROL)
This shift register deliver commands from the µP to control the AF functions which include source selection (A0 & A1 control lines), DSC modes , DBB, IS and CD_STBY. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the µP on the Front board.

b) SOURCE SELECTION
One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to th e selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

c) PWM VOLUME CONTROL
The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (ON4986 or selected BC557B) and PWM control signal from µP. For good performance transistors for the left and right channels should be paired for gain characteristics.

d) SOUND FEATURES
Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069UBT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER
IC 7391 (AN7125) is used as power amplifier.

f) CD_STBY CONTROL
This Transistor 7401 (BC337-25) switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

g) MATRIX SURROUND OUTPUT
The matrix surround feature is provided on board. This feature is only optional on certain type version.

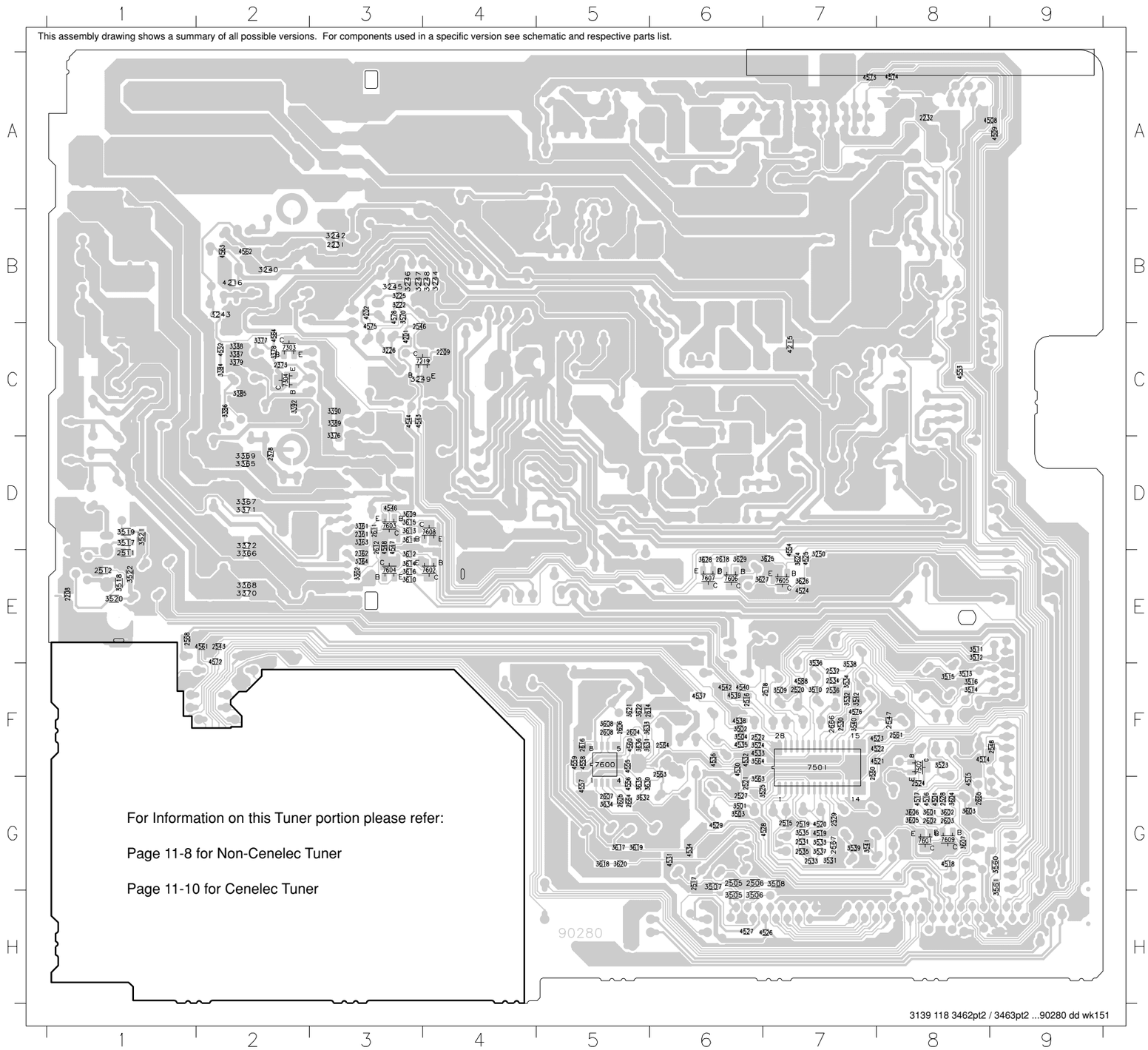
D. KARAOKE PART
This simple Karaoke consists of a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

E. HEADPHONE PART
The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

F. CDC KEY PART
The CDC key buttons and LEDs are provided on this board.

11-2

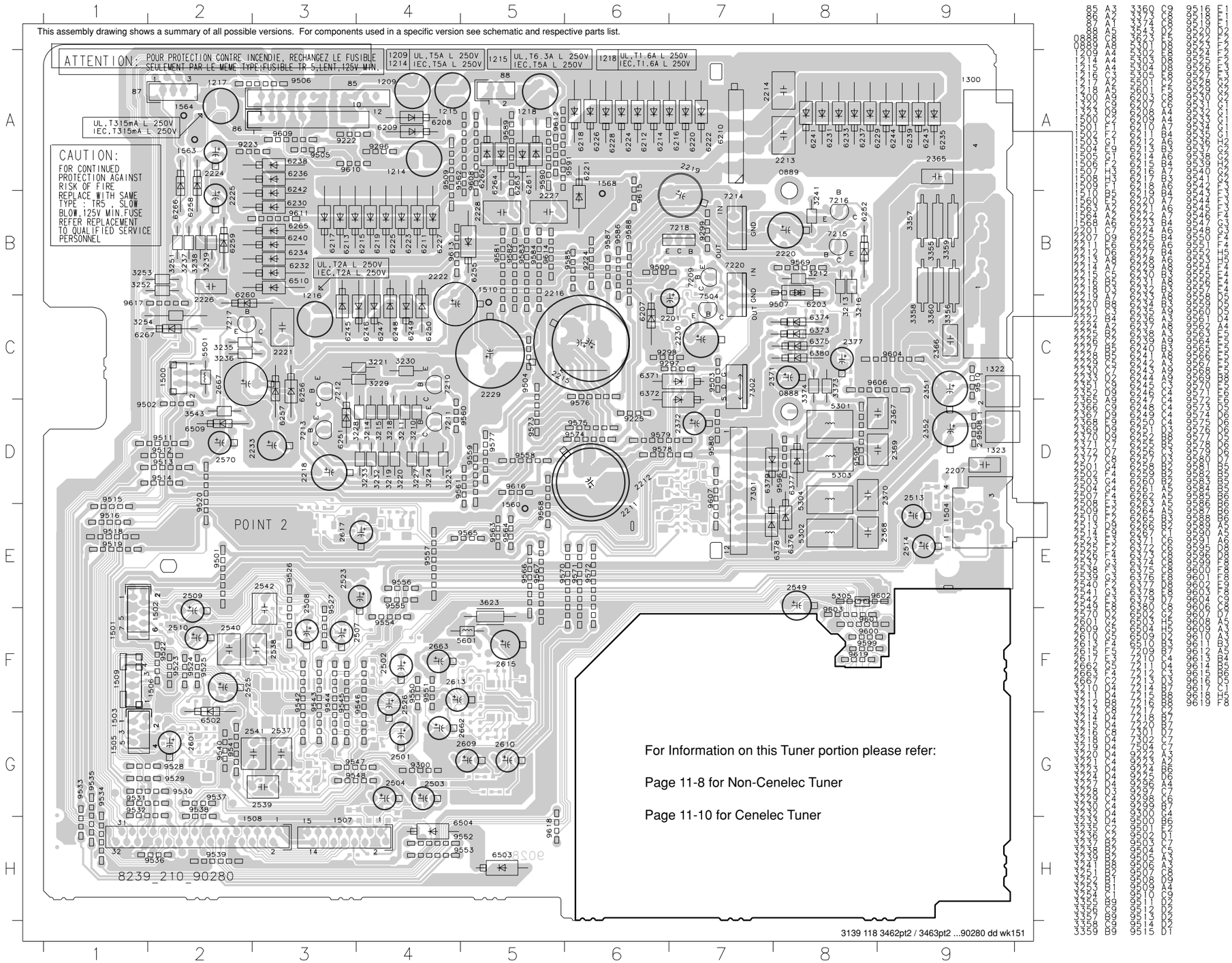
CHIP LAYOUT - MAIN PART (excluding the Tuner portion)


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
For Information on this Tuner portion please refer:
Page 11-8 for Non-Cenelec Tuner
Page 11-10 for Cenelec Tuner
7600
7501
90280
3139 118 3462pt2 / 3463pt2 ...90280 dd wk151

2208 E1 3539 G7
2209 C4 3540 F7
2231 B3 3541 G7
2232 A8 3542 F7
2361 D2 3560 G9
2362 E3 3561 G9
2373 C2 3563 G6
2375 D2 3564 E9
2505 G6 3570 B3
2506 G6 3601 G8
2511 E1 3602 G8
2512 E1 3603 G8
2515 E7 3604 G8
2516 E6 3605 G8
2517 G6 3606 G8
2518 E7 3607 G8
2519 G7 3608 D9
2520 F7 3609 D3
2521 G6 3610 D3
2522 F6 3611 D3
2524 G8 3612 E3
2527 G6 3613 E3
2528 G8 3614 E3
2529 G7 3615 D3
2530 F7 3616 E3
2531 G7 3617 C9
2532 F7 3618 C9
2533 G7 3619 C9
2534 F7 3620 C9
2535 G7 3621 E7
2536 F7 3622 E7
2543 E2 3624 E7
2546 C3 3625 E7
2547 E8 3626 E7
2548 E7 3627 E8
2560 E7 3628 E8
2561 E6 3629 E8
2563 E6 3630 C9
2564 G7 3631 C9
2567 C2 3632 C9
2568 C1 3633 C9
2602 G8 3634 C9
2603 G6 3635 C9
2604 G6 3636 C9
2605 G5 4201 C3
2606 G5 4202 C3
2607 G5 4215 C7
2608 D3 4216 B3
2611 D3 4501 A8
2612 D3 4508 A9
2614 D5 4509 A9
2616 E5 4514 E8
2617 E6 4515 C8
2664 C8 4516 C8
2665 C8 4517 C8
2666 E7 4518 C7
3222 B3 4519 G7
3225 B3 4520 G7
3226 B3 4521 E8
3240 B3 4522 E8
3242 B3 4523 E8
3243 B2 4524 E7
3244 B3 4525 E7
3245 B3 4526 H7
3246 B3 4527 H7
3247 B3 4528 G8
3248 B3 4529 G8
3249 B3 4530 E8
3250 E7 4531 G8
3361 D3 4532 G8
3362 E3 4533 G8
3363 E3 4534 G8
3364 E3 4535 G8
3365 D2 4536 E8
3366 E2 4537 E8
3367 E2 4538 E8
3368 E2 4539 E8
3369 D2 4540 E8
3370 E3 4542 C3
3371 D2 4543 C3
3372 D2 4544 C3
3376 C2 4546 D3
3377 C2 4547 D3
3378 C2 4548 D3
3379 C2 4552 C8
3384 C2 4554 C8
3385 C2 4555 C8
3386 C2 4556 C8
3387 C2 4557 C8
3388 C3 4558 C8
3389 C3 4559 C8
3390 C3 4560 C8
3392 C2 4561 C8
3501 G6 4562 C8
3502 G6 4563 C8
3503 G6 4564 C8
3504 F6 4572 A7
3505 F6 4573 A7
3506 G6 4574 A8
3507 G6 4575 C8
3508 G7 4576 C7
3509 F7 4577 C7
3510 F7 4588 E7
3511 E8 7219 C3
3512 E8 7303 C2
3513 E8 7304 C2
3514 E8 7501 F7
3516 E8 7502 F8
3517 D1 7600 E8
3518 D1 7601 G8
3519 D1 7602 G8
3520 D1 7603 D3
3521 D1 7604 D3
3522 E8 7605 E7
3523 E8 7606 E8
3524 E8 7607 E8
3525 G6 7608 D4
3531 G7 7609 C8
3532 F7
3533 F7
3534 F7
3535 G7
3536 F7
3537 G7
3538 F7

11-3

COMPONENT LAYOUT - MAIN PART (excluding the Tuner portion)


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
ATTENTION: POUR PROTECTION CONTRE INCENDIE, RECHANGEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE:FUSIBLE TR 5,LENT,125V MIN.
1209 1214 UL,T5A L 250V IEC,T5A L 250V
1215 UL,T6.3A L 250V IEC,T5A L 250V
1218 UL,T1.6A L 250V IEC,T1.6A L 250V
UL,T315mA L 250V IEC,T315mA L 250V
CAUTION:
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE : TR5 , SLOW BLOW,125V MIN.FUSE REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
UL,T2A L 250V IEC,T2A L 250V
POINT 2
8239_210_90280
For Information on this Tuner portion please refer:
Page 11-8 for Non-Cenelec Tuner
Page 11-10 for Cenelec Tuner
3139 118 3462pt2 / 3463pt2 ...90280 dd wk151

85	A3	3360	C9	9516	F1
86	A2	3373	C8	9518	F1
87	A1	3374	C8	9519	F1
88	A5	3543	D2	9520	D2
0888	C8	3623	F5	9522	F2
0889	A8	5301	D8	9523	F2
1209	A4	5302	E8	9524	F2
1214	A4	5303	D8	9525	F2
1215	A4	5304	B8	9526	F3
1216	C3	5305	E8	9527	F3
1217	A2	5501	C2	9528	G2
1218	A5	5601	F5	9529	G2
1300	A9	6203	C8	9530	G2
1322	C9	6207	C6	9531	G1
1323	D9	6208	A4	9532	G1
1500	C2	6209	A4	9533	G1
1501	F1	6210	A7	9534	G1
1502	F2	6211	B4	9535	G1
1503	G1	6212	A6	9536	H2
1504	E9	6213	B3	9537	G2
1505	G1	6214	A6	9538	G2
1506	G2	6215	B4	9539	H2
1507	H3	6216	A7	9540	G2
1508	H3	6217	B3	9541	G2
1509	F1	6218	A6	9542	F3
1510	E5	6219	B4	9543	F3
1563	A2	6221	A6	9545	F3
1564	A2	6222	A7	9546	F4
1568	A6	6223	B4	9547	G3
2201	C7	6224	A6	9548	G3
2207	D9	6225	B4	9550	F4
2211	E6	6226	A6	9551	F4
2212	D6	6227	B4	9552	H5
2213	A7	6228	A8	9553	H5
2214	A7	6229	B5	9554	F4
2215	C5	6230	B3	9555	F4
2216	B5	6231	A8	9556	F4
2218	A7	6232	B8	9557	F4
2220	B8	6234	B3	9559	D5
2221	C3	6235	A9	9560	D5
2222	B4	6236	A8	9561	D4
2224	B2	6237	A8	9562	E4
2225	B2	6238	A3	9563	E5
2226	C2	6239	A9	9564	F5
2227	B5	6240	B3	9565	F5
2228	B5	6241	A9	9566	F5
2229	C7	6242	A3	9567	F5
2230	C7	6243	A9	9568	F5
2233	D2	6244	A9	9569	F5
2251	C9	6245	C4	9570	F5
2252	C9	6246	C4	9571	F5
2365	A9	6247	C4	9572	F6
2366	C9	6248	C4	9573	D5
2367	D9	6249	C4	9574	D6
2368	B9	6250	C3	9575	D6
2369	B9	6251	C3	9576	D6
2370	D9	6252	B8	9577	D5
2371	C7	6255	B5	9578	D6
2372	D8	6256	C3	9579	D6
2377	C8	6257	C3	9580	D6
2501	C4	6258	B2	9581	B5
2502	F4	6259	B2	9582	B5
2503	G4	6260	B2	9583	B5
2504	F4	6261	A5	9584	B5
2507	F4	6262	A5	9585	B6
2508	F3	6263	A5	9586	B6
2509	F2	6264	A5	9587	B6
2510	F2	6265	B3	9588	B6
2513	F9	6267	C1	9590	A5
2523	F3	6371	C6	9591	A6
2525	F2	6372	C6	9595	D8
2526	F4	6373	C8	9596	D8
2527	C3	6374	C8	9599	F8
2538	F3	6375	C8	9600	F8
2539	C3	6376	F8	9601	F8
2540	F3	6377	F8	9602	F8
2541	C3	6378	F8	9603	F8
2542	F3	6379	D7	9604	C9
2549	F8	6380	C8	9606	C8
2570	C2	6502	G2	9607	D7
2601	C5	6503	H5	9608	A5
2609	C5	6504	H5	9609	A3
2610	C5	6509	D2	9610	A3
2615	F4	6510	B3	9611	B3
2615	F3	7209	B7	9612	A5
2617	F3	7210	C4	9613	B4
2662	C5	7211	D4	9614	B5
2663	F4	7212	C3	9615	B6
2667	C2	7213	D3	9616	C5
3210	D4	7214	B7	9617	C1
3211	D4	7215	B8	9618	H5
3212	D8	7216	B8	9619	F8
3213	C8	7217	C2		
3214	D4	7218	B7		
3215	D4	7220	B7		
3216	C8	7301	D7		
3218	D4	7302	C7		
3219	D4	7504	C7		
3220	D4	9222	A3		
3221	C4	9223	A2		
3223	D4	9224	B6		
3224	D4	9225	D6		
3226	D4	9226	A4		
3227	D4	9296	C7		
3228	D3	9297	C7		
3229	C4	9298	C6		
3230	C4	9299	B7		
3232	D4	9300	B4		
3233	D4	9500	B6		
3235	C2	9501	F2		
3236	C2	9502	D1		
3237	B2	9503	C7		
3238	B2	9504	C5		
3239	B2	9505	A3		
3241	D8	9506	A3		
3251	B2	9507	C8		
3252	B1	9508	D9		
3253	B1	9509	A4		
3254	C1	9510	C9		
3355	B9	9511	D2		
3356	C9	9512	D2		
3357	B9	9513	D2		
3358	C9	9514	D2		
3359	B9	9515	D1		

11-4

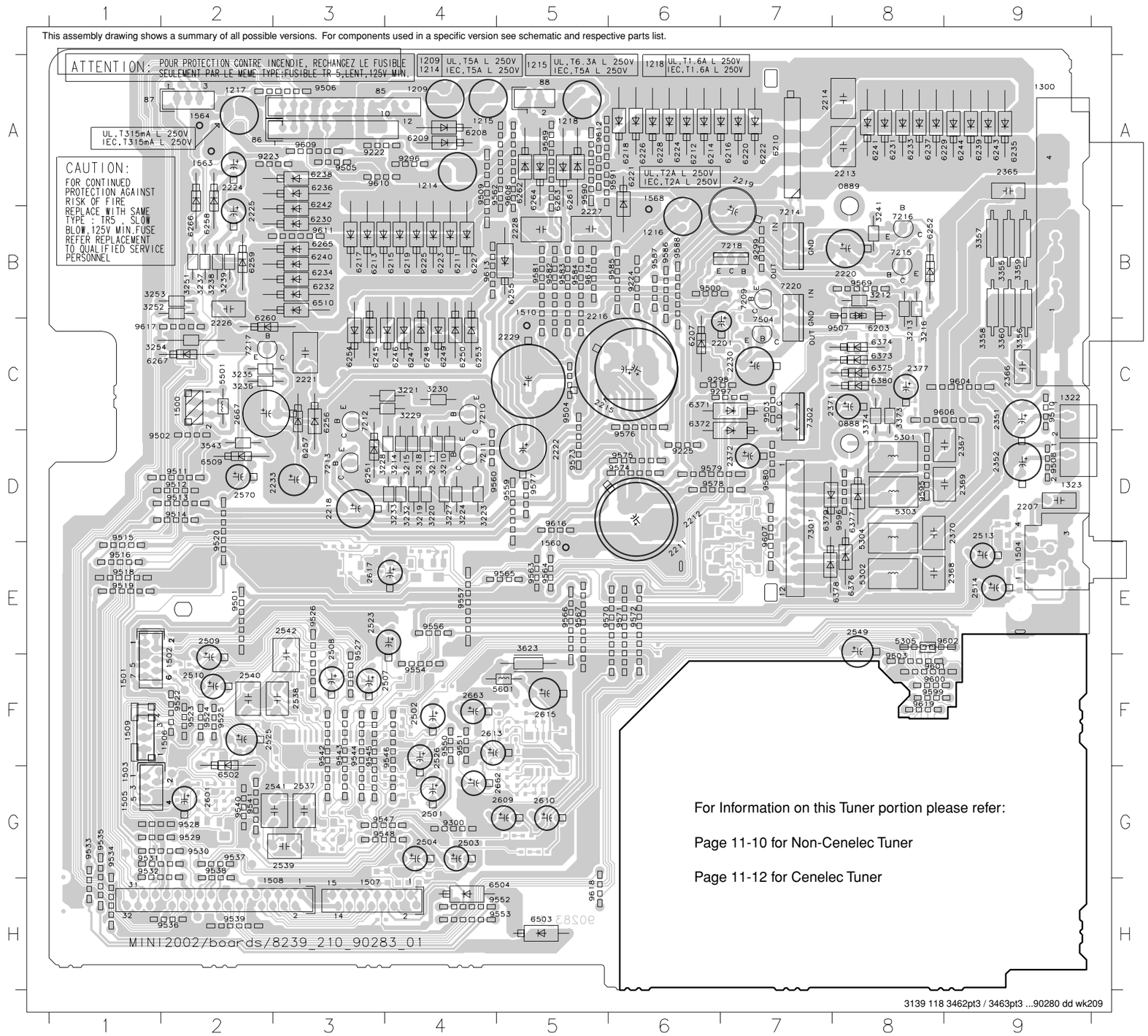
CHIP LAYOUT - MAIN PART (excluding the Tuner portion)

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
For Information on this Tuner portion please refer:
Page 11-10 for Non-Cenelec Tuner
Page 11-12 for Cenelec Tuner
90283_01
3139 118 3462pt3 / 3463pt3 ...90280 dd wk209

2208 E1 3536 E7
2209 E1 3537 E7
2231 B3 3538 E7
2232 A6 3539 G7
2233 B3 3540 E7
2234 B3 3541 E7
2235 A3 3542 E7
2236 B3 3560 G9
2361 D3 3561 G9
2362 E3 3563 G6
2373 C2 3564 F6
2378 D2 3570 B3
2505 G6 3601 G8
2506 G6 3602 G8
2511 E1 3603 G8
2512 E1 3604 G8
2514 G7 3605 G8
2516 F6 3606 G8
2517 G6 3607 G8
2518 F7 3608 G5
2519 G7 3609 D3
2520 H7 3610 E3
2521 G6 3611 D3
2522 F6 3612 D3
2524 G6 3613 E3
2527 G6 3614 E3
2528 G6 3615 D3
2529 G7 3616 E3
2530 F7 3617 G5
2531 G7 3618 G5
2532 F7 3619 G5
2533 G7 3620 F5
2534 F7 3621 F5
2535 F7 3622 F5
2543 F2 3624 E7
2546 G3 3625 E7
2547 G3 3626 E7
2548 F6 3627 E7
2560 F7 3628 F6
2561 F6 3629 F6
2562 G6 3630 G5
2564 F6 3631 G5
2567 G7 3632 G5
2568 E1 3633 F5
2602 G6 3634 G5
2603 G6 3635 G5
2604 G6 3636 G5
2605 G5 4201 C3
2606 F2 4202 C3
2607 G5 4216 B3
2608 G5 4501 B8
2611 D3 4508 A9
2612 D3 4509 A9
2614 E5 4514 F8
2616 E5 4515 G8
2618 E5 4516 G8
2664 G5 4517 G8
2665 G5 4518 G8
2666 F7 4519 G7
3222 B3 4520 G7
3226 B3 4521 F8
3240 B3 4522 F8
3242 B3 4524 E7
3243 B2 4525 E7
3244 B3 4526 F7
3245 B3 4527 E4
3246 B3 4528 G7
3247 B3 4529 G6
3248 B3 4530 G6
3249 C3 4531 F6
3250 F7 4532 F6
3361 D3 4533 F6
3362 E3 4534 F6
3363 E3 4535 F6
3364 E3 4536 F6
3365 D2 4537 F6
3366 E2 4538 F6
3367 E2 4539 F6
3368 E2 4540 F6
3369 D2 4542 F6
3370 E2 4543 C3
3371 D2 4544 C3
3372 C2 4546 C3
3376 C2 4547 D3
3377 C2 4548 D3
3378 C2 4552 C2
3384 C2 4553 C2
3385 C2 4554 E7
3386 C2 4555 F5
3387 C2 4556 G5
3388 C2 4557 F5
3389 C2 4558 F5
3390 C2 4560 F5
3392 C2 4561 E2
3501 G6 4562 B2
3502 G6 4563 B2
3503 G6 4564 C2
3504 F6 4572 E2
3505 H6 4573 A7
3506 H6 4574 A8
3507 G6 4575 C3
3508 G7 4576 F7
3509 F7 4578 E4
3510 F7 4588 E4
3511 D8 7210 C3
3512 E8 7303 C3
3513 E8 7304 C2
3514 E8 7501 F7
3515 E8 7502 F8
3516 E8 7600 F5
3517 D1 7601 G8
3518 E1 7602 E4
3519 D1 7603 E3
3520 E1 7604 E3
3521 D1 7605 E7
3522 E1 7606 E6
3523 F6 7607 D4
3524 G6 7608 D4
3525 G6 7609 G8
3531 G7
3532 F7
3533 F7
3534 F7
3535 G7

11-5

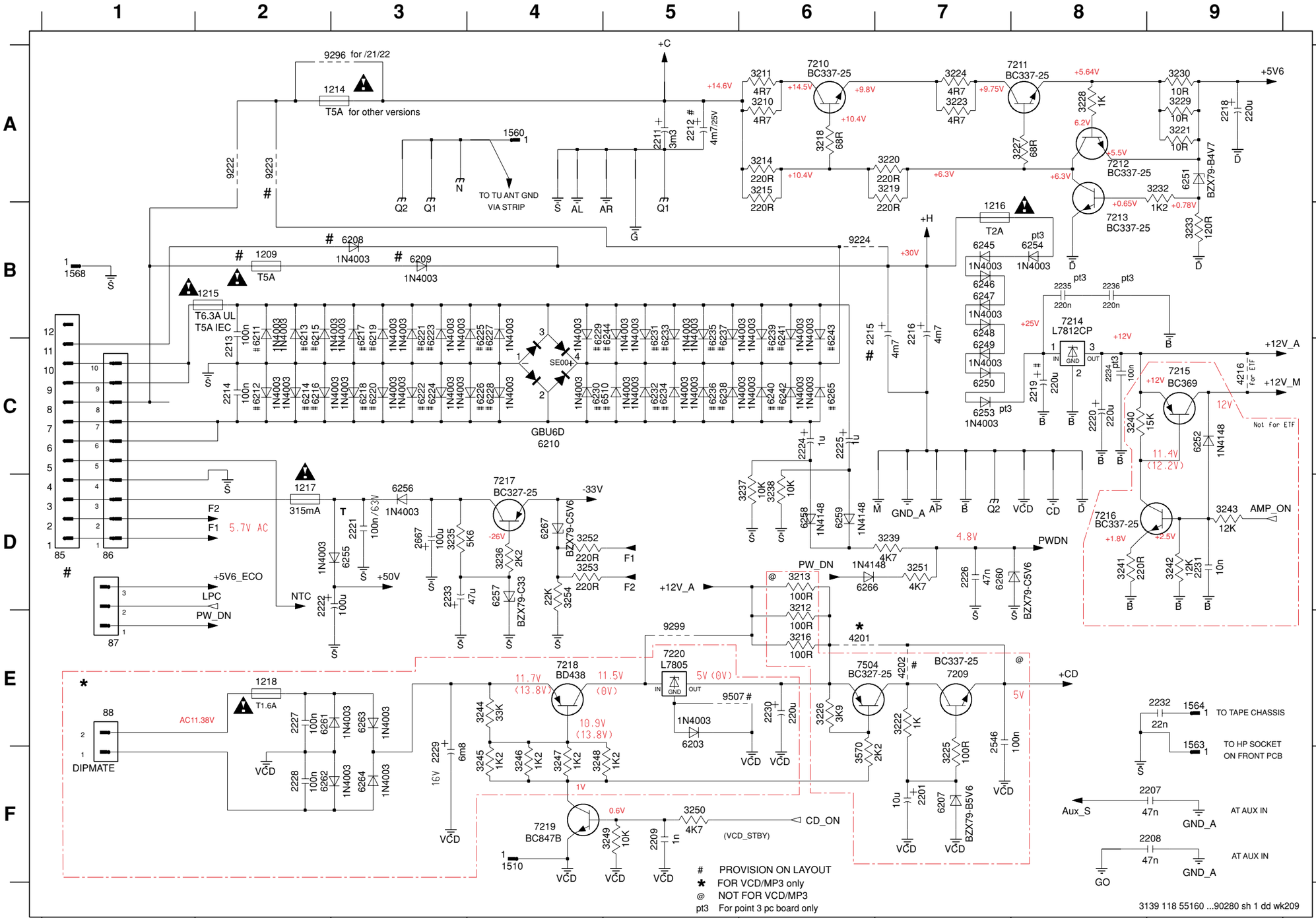
COMPONENT LAYOUT - MAIN PART (excluding the Tuner portion)


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
ATTENTION: POUR PROTECTION CONTRE INCENDIE, REMPLACEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE:FUSIBLE TR 5,LENT,125V MIN.
1209 1214 UL,T5A L 250V IEC,T5A L 250V
1215 UL,T6.3A L 250V IEC,T5A L 250V
1218 UL,T1.6A L 250V IEC,T1.6A L 250V
UL,T315mA L 250V IEC,T315mA L 250V
UL,T2A L 250V IEC,T2A L 250V
CAUTION:
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE : TR5 , SLOW BLOW,125V MIN.FUSE REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
For Information on this Tuner portion please refer:
Page 11-10 for Non-Cenelec Tuner
Page 11-12 for Cenelec Tuner
MINI2002/boards/8239_210_90283_01
3139 118 3462pt3 / 3463pt3 ...90280 dd wk209

85 A3 3360 C9 9514 D2
86 A2 3373 C8 9515 D2
87 A1 3374 C8 9516 E1
88 A3 3543 D2 9517 E1
0888 C8 5623 E5 9518 E2
0889 A8 5301 D5 9519 E2
1209 A4 5302 E5 9520 E2
1214 A4 5303 D6 9521 F2
1215 A4 5304 D6 9522 F2
1216 B6 5305 E5 9523 F2
1217 A2 5501 C2 9524 F2
1218 A5 5601 F5 9525 F2
1300 A9 6203 C8 9526 G2
1322 C9 6207 C6 9527 G2
1323 C9 6208 A4 9528 G2
1500 C2 6209 A4 9529 G1
1501 F1 6210 A7 9530 G1
1502 C2 6211 B4 9531 G1
1503 C1 6212 A6 9532 G1
1504 E9 6213 B3 9535 G1
1505 G1 6214 A6 9536 H2
1506 F2 6215 B4 9537 G2
1507 H3 6216 A7 9538 G2
1508 F3 6217 B3 9539 H2
1509 F1 6218 A6 9540 G2
1510 B5 6219 B4 9541 G2
1560 E5 6220 A7 9542 F3
1563 A2 6222 A7 9544 F3
1564 A2 6223 B4 9545 F3
1568 A6 6224 A6 9546 F4
2201 C7 6225 B4 9547 G3
2207 D9 6226 A6 9548 G3
2211 D6 6227 B4 9550 F4
2212 D6 6228 A6 9551 F4
2213 A8 6229 A8 9552 F4
2214 A7 6230 B3 9553 F4
2215 B5 6231 A8 9554 F5
2216 D3 6232 B3 9556 F4
2217 A7 6233 A8 9557 F4
2218 B5 6234 B3 9559 D5
2219 B9 6235 B8 9560 D4
2220 B9 6236 A3 9562 A4
2221 B9 6237 A8 9563 F5
2222 D5 6238 A3 9564 F5
2223 A3 6240 B3 9565 F5
2224 A3 6241 A8 9566 F5
2225 B3 6242 A3 9567 F5
2226 B5 6243 B8 9568 B6
2227 B5 6244 A8 9569 B6
2228 B5 6245 A3 9570 B6
2229 C5 6246 A3 9571 B6
2230 C2 6247 A3 9572 B6
2231 C2 6248 A3 9573 D5
2232 C5 6249 A3 9574 D6
2233 C2 6250 A3 9575 D6
2234 C5 6251 D3 9576 D6
2235 C2 6252 A3 9577 D5
2236 A3 6253 A3 9578 D6
2237 A8 6254 A3 9579 D6
2238 A3 6255 B3 9580 D6
2239 B8 6256 B2 9581 B5
2240 B3 6257 C2 9582 B5
2241 A8 6258 A2 9583 B5
2242 A3 6259 A2 9584 B5
2243 A8 6260 A2 9585 B5
2244 A8 6261 A2 9586 B5
2245 C3 6262 A2 9587 B5
2246 C4 6263 A2 9588 B5
2247 C4 6264 A2 9589 A5
2248 C4 6265 B2 9590 A5
2249 C4 6266 B2 9595 D6
2250 C4 6267 C2 9596 D6
2251 D3 6371 C6 9597 D6
2252 D3 6372 C6 9598 E6
2253 C7 6373 C6 9599 E6
2254 C7 6374 C6 9600 F6
2255 B5 6375 C6 9601 F6
2256 B2 6376 C6 9602 E6
2257 C2 6377 D6 9603 E6
2258 B2 6378 E6 9604 C6
2259 B2 6379 D7 9606 C6
2260 B2 6501 H5 9607 D7
2261 A5 6502 G2 9608 A5
2262 A5 6503 H5 9609 A3
2263 A5 6504 H5 9610 A3
2264 A5 6509 D3 9611 B3
2265 B3 6510 B3 9612 A5
2266 B2 7209 B7 9613 B4
2267 C2 7210 C4 9614 B5
2371 C6 7211 D4 9615 D5
2372 C6 7212 C3 9616 H5
2373 C6 7213 C3 9617 C1
2374 C6 7214 B7 9618 H5
2375 C6 7215 B8 9619 F8
2376 C6 7216 B7
2377 D6 7217 C7
2378 E6 7218 B7
2379 D7 7220 B7
2501 G5 7301 D7
2502 G5 7302 D7
2503 G5 7504 C7
2504 G4 9222 A3
2505 F4 9223 A2
2507 F4 9224 B5
2508 F3 9225 D6
2509 F3 9296 A4
2510 F3 9297 C7
2511 F4 9298 C6
2512 F4 9299 B7
2513 F4 9300 G4
2514 F4 9500 B6
2515 F4 9501 F2
2516 F4 9502 D7
2517 F4 9503 C7
2518 F4 9504 C5
2519 F4 9505 A3
2520 F4 9506 A5
2521 F4 9507 C5
2522 F4 9508 D6
2523 F4 9509 A4
2524 F4 9510 C6
2525 F4 9511 D2
2526 F4 9512 D2
2527 F4 9513 D2

11-6

POWER SUPPLY CIRCUIT

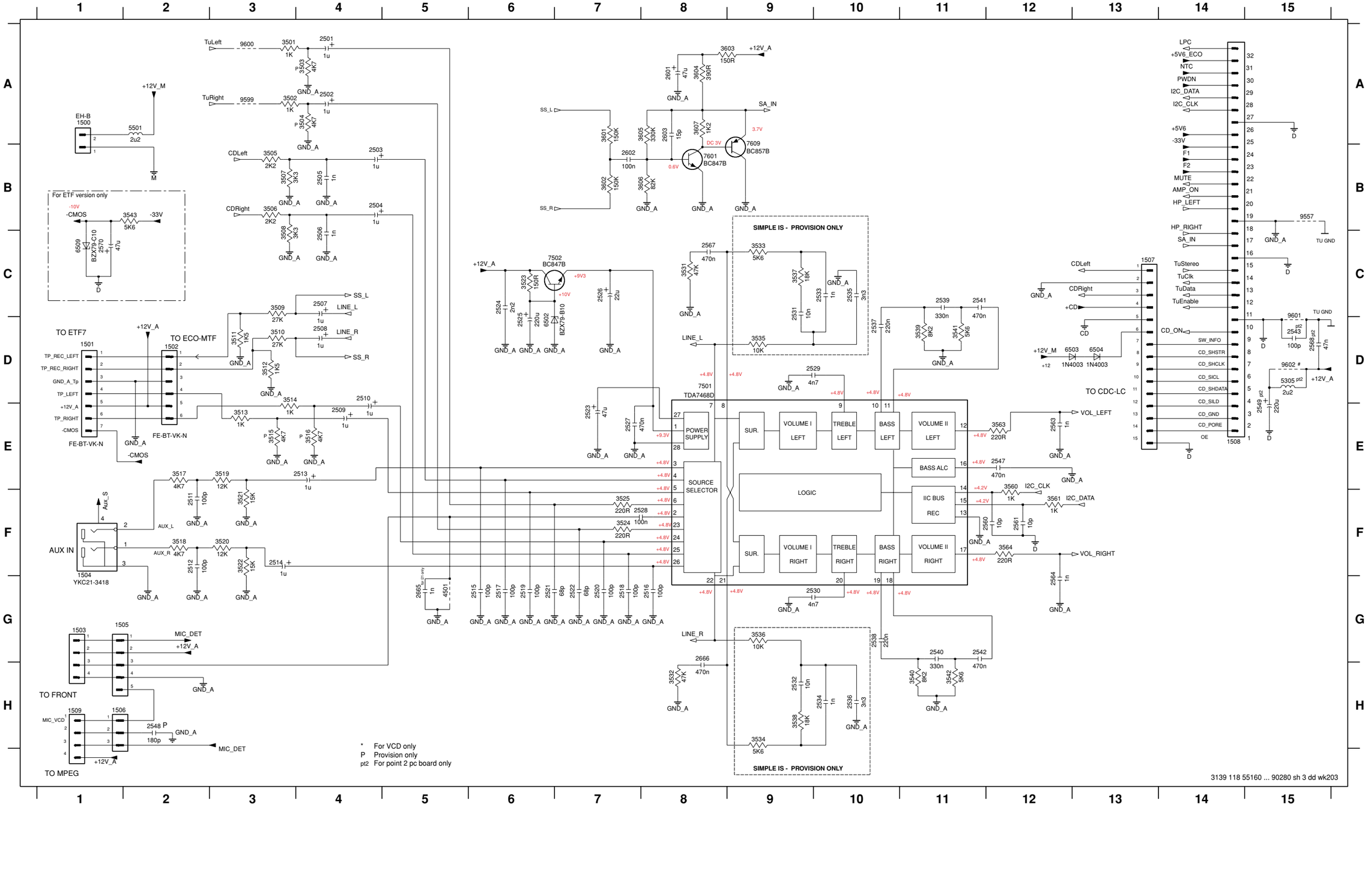


85 D1	3250 F5	7219 F4
86 D1	3251 D7	7220 E5
87 E1	3252 D4	7504 E6
88 E1	3253 D4	9222 A2
1209 B2	3254 D4	9223 A2
1214 A3	3570 F6	9224 B6
1215 B2	4201 E6	9296 A3
1216 B7	4202 E7	9299 E5
1217 D2	4216 C9	9507 E5
1218 E2	6203 E5	
1510 F4	6207 F7	
1560 A4	6208 B3	
1563 F9	6209 B3	
1564 E9	6210 C4	
1568 B1	6211 B2	
2201 F7	6212 C2	
2207 F9	6213 B2	
2208 F9	6214 C2	
2209 F5	6215 B2	
2211 A5	6216 C2	
2212 A5	6217 B3	
2213 B2	6218 C3	
2214 C2	6219 B3	
2215 B6	6220 C3	
2216 B7	6221 B3	
2218 A9	6222 C3	
2219 C8	6223 B3	
2220 C8	6224 C3	
2221 D3	6225 B4	
2222 D2	6226 C4	
2224 C6	6227 B4	
2225 C6	6228 C4	
2226 D7	6229 B4	
2227 E2	6230 C4	
2228 F2	6231 B5	
2229 F3	6232 C5	
2230 E6	6233 B5	
2231 D9	6234 C5	
2232 E9	6235 B5	
2233 D3	6236 C5	
2234 C8	6237 B5	
2235 B8	6238 C5	
2236 B8	6239 B6	
2546 E7	6240 C6	
2667 D3	6241 B6	
3210 A6	6242 C6	
3211 A6	6243 B6	
3212 E6	6244 B5	
3213 D6	6245 B7	
3214 A6	6246 B7	
3215 A6	6247 B7	
3216 E6	6248 B7	
3218 A6	6249 C7	
3219 A7	6250 C7	
3220 A7	6251 A9	
3221 A9	6252 C9	
3222 E7	6253 C7	
3223 A7	6254 B8	
3224 A7	6255 D3	
3225 F7	6256 D3	
3226 E6	6257 D4	
3227 A8	6258 D6	
3228 A8	6259 D6	
3229 A9	6260 D7	
3230 A9	6261 E2	
3232 A9	6262 F2	
3233 B9	6263 E3	
3235 D3	6264 F3	
3236 D4	6265 C6	
3237 D6	6266 D6	
3238 D6	6267 D4	
3239 D7	6510 C5	
3240 C8	7209 E7	
3241 D8	7210 A6	
3242 D9	7211 A7	
3243 D9	7212 A8	
3244 E4	7213 B8	
3245 F4	7214 B8	
3246 F4	7215 C9	
3247 F4	7216 D8	
3248 F4	7217 D4	
3249 F5	7218 E4	

11-7

SOURCE SELECTION CIRCUIT

C3 E15 C4 E15 C5 D15 C6 C15 C7 C15 C8 C15 C10 C14 C11 A3 C13 A3 C14 C15 T_E D14 1500 A1 1501 D1 1502 D2 1503 G1 1504 F1 1505 G2 1506 H1 1507 C13 1508 E14 1509 H1 2501 A4 2502 A4 2503 B4 2504 B4 2505 B4 2506 C4 2507 C4 2508 D4 2509 E4 2510 D4 2511 F2 2512 F2 2513 E4 2514 F3 2515 G6 2516 G8 2517 G6 2518 G7 2519 G6 2520 G7 2521 G6 2522 E7 2523 E7 2524 C6 2525 D6 2526 C7 2527 E7 2528 F7 2529 D9 2530 G9 2531 C9 2532 H9 2533 C10 2534 H10 2535 C10 2536 H10 2537 D10 2538 G10 2539 C11 2540 G11 2541 C11 2542 G11 2543 D15 2547 E12 2548 H2 2549 E15 2560 F12 2561 F12 2563 E12 2564 G12 2567 C8 2568 D15 2570 C1 2601 A8 2602 B7 2603 A8 2665 G5 2666 G8 3501 A3 3502 A3 3503 A4 3504 A4 3505 B3 3506 B3 3507 B3 3508 C3 3509 C3 3510 D3 3511 D3 3512 D3 3513 E3 3514 D3 3515 E3 3516 E4 3517 E2 3518 F2 3519 E3 3520 F3 3521 F3 3522 F3 3523 C6 3524 F7 3525 F7 3531 C8 3532 H8 3533 C9 3534 H9 3535 D9 3536 G9 3537 C9 3538 H9 3539 D11 3540 H11 3541 D11 3542 H11 3543 B2 3560 E12 3561 F12 3563 E12 3564 F12 3601 A7 3602 B7 3603 A9 3604 A8 3605 A8 3606 B8 3607 A8 4501 G5 5305 D15 5501 A2 6502 D6 6503 D12 6504 D13 6509 C1 7501 D8 7502 C7 7601 B8 7609 B9 9557 B15 9599 A3 9600 A3 9601 D15 9602 D15 9603 E15 TU_LEFT A3 T_E1 D14

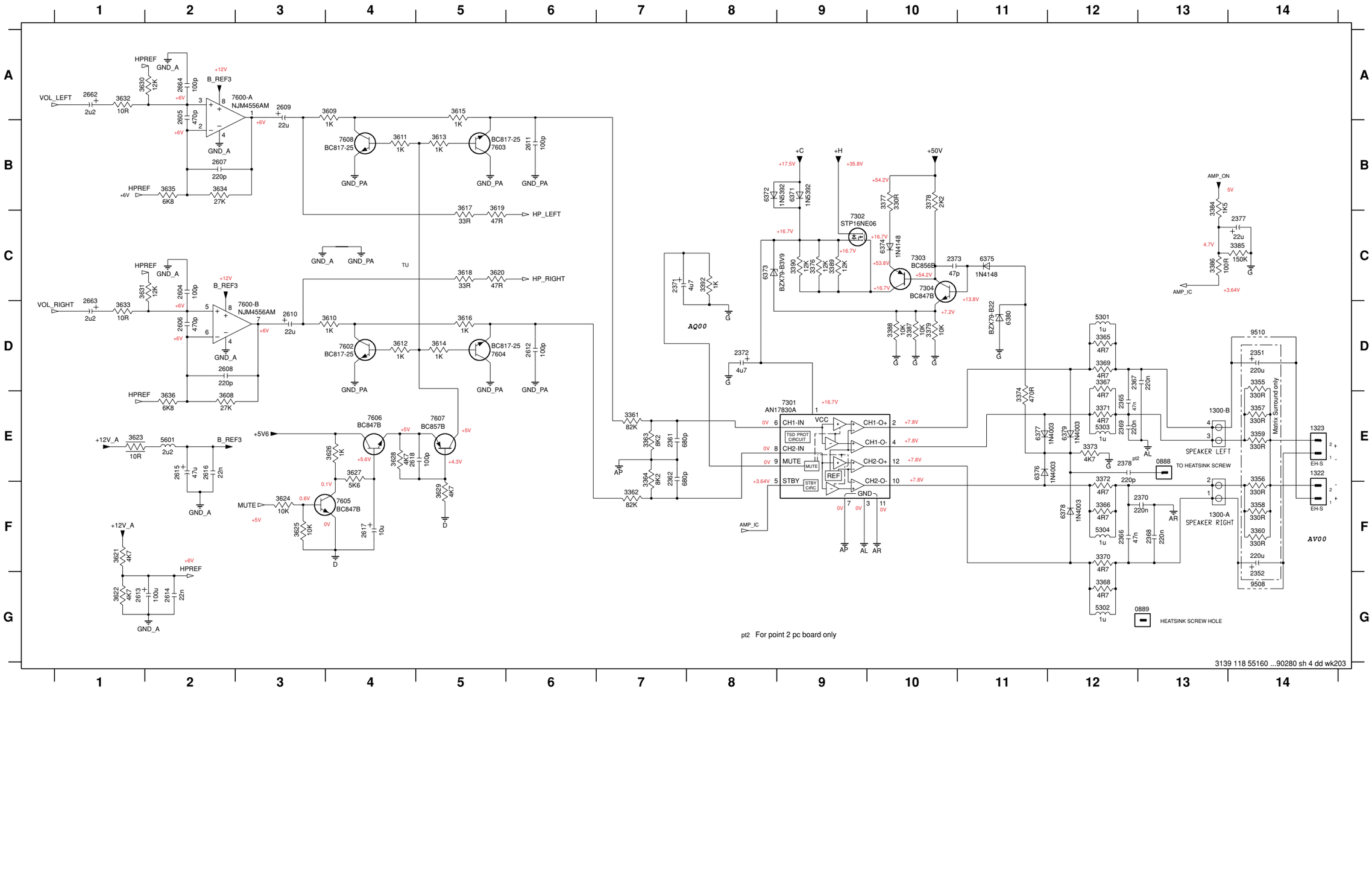


3139 118 55160 ... 90280 sh 3 dd wk203

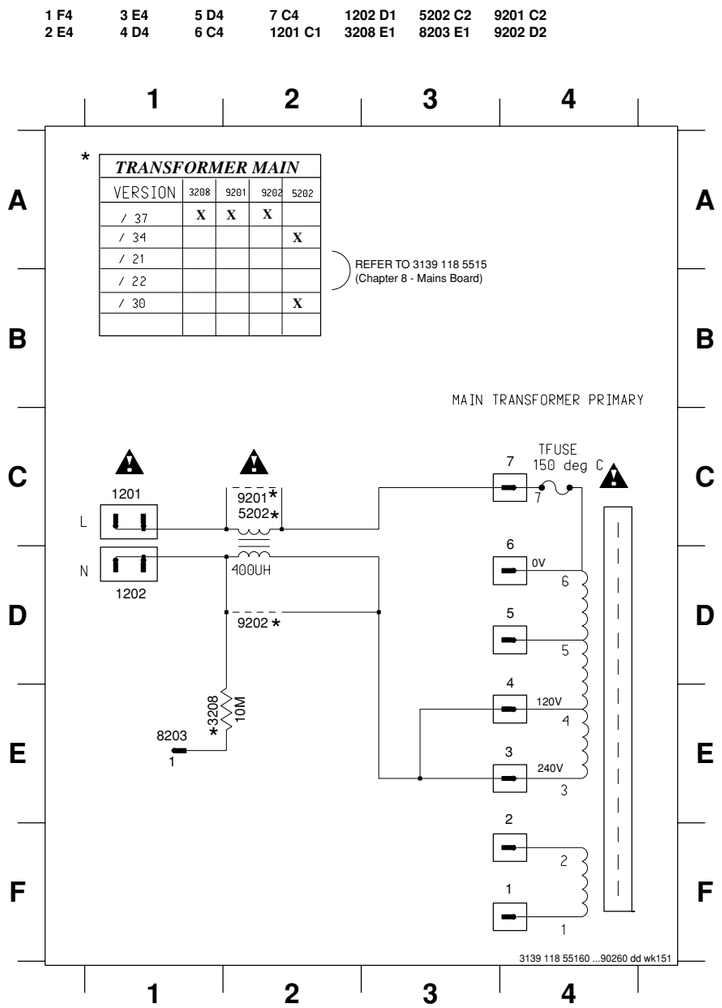
11-8

PRE- & POWER AMPLIFIER CIRCUIT

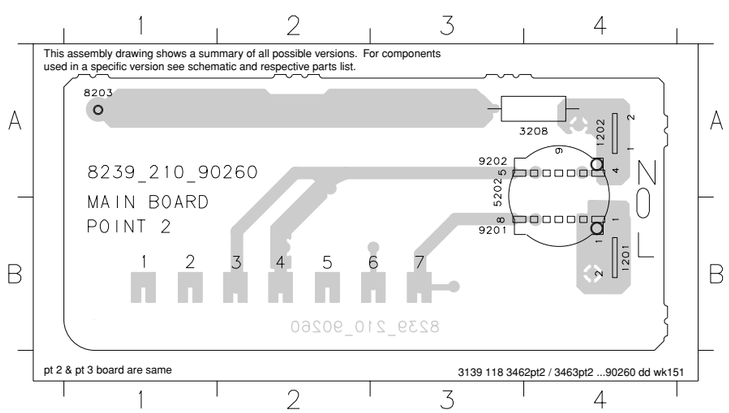
0888 E13 0889 G13 1300-A F13 1300-B E13 1322 E14
1323 E14 2351 D14 2352 F14 2361 E7 2362 E7
2365 E12 2366 F12 2367 D12 2368 F13 2369 E12
2370 F13 2371 C7 2372 D8 2373 C10 2377 C14
2378 E12 2604 C2 2605 A2 2606 D2 2607 B2
2608 D2 2609 A3 2610 D3 2611 B6 2612 D6
2613 G1 2614 G2 2615 E2 2616 E2 2617 F4
2618 E4 2662 A1 2663 D1 2664 A2 3355 D14
3356 E14 3357 E14 3358 F14 3359 E14 3360 F14
3361 E7 3362 F7 3363 E7 3364 E7 3365 D12
3366 F12 3367 D12 3368 G12 3369 D12 3370 F12
3371 E12 3372 E12 3373 E12 3374 E11 3376 C9
3377 B10 3378 B10 3379 D10 3384 B13 3385 C14
3386 C13 3387 D10 3388 D10 3389 C9 3390 C9
3392 C8 3608 E2 3609 A4 3610 D4 3611 B4
3612 D4 3613 B5 3614 D5 3615 A5 3616 D5
3617 B5 3618 C5 3619 B5 3620 C5 3621 F1
3622 G1 3623 E1 3624 F3 3625 F3 3626 E4
3627 E4 3628 E4 3629 F5 3630 A1 3631 C1
3632 A1 3633 D1 3634 B2 3635 B2 3636 E2
5301 D12 5302 G12 5303 E12 5304 F12 5601 E2
6371 B9 6372 B8 6373 C8 6374 C10 6375 C11
6376 E11 6377 E11 6378 F12 6379 E12 6380 D11
7301 E9 7302 C9 7303 C10 7304 C10 7600-A A2
7600-B D3 7602 D4 7603 B5 7604 D5 7605 F4
7606 E4 7607 E5 7608 B4 9508 G14 9510 D14



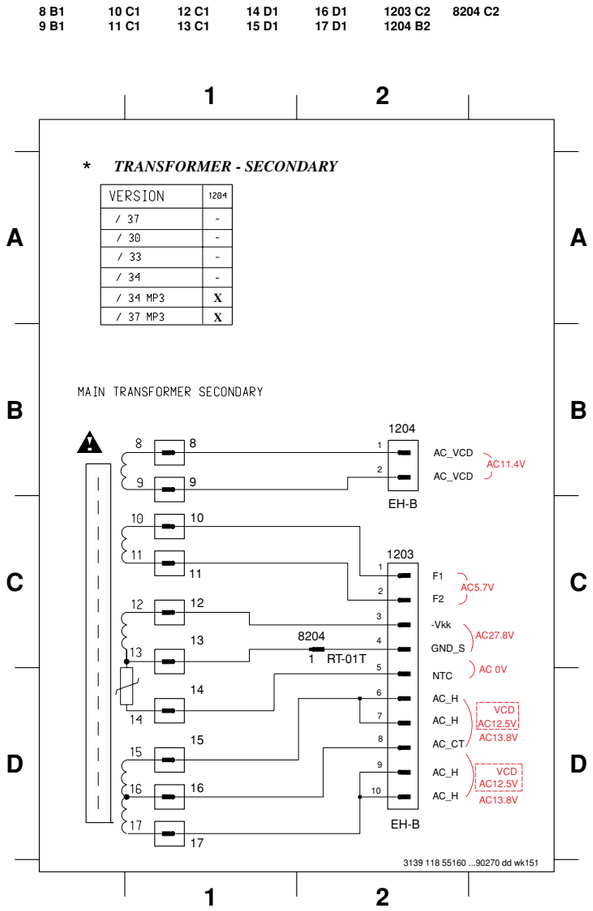
TRANSFORMER PRIMARY PART - CIRCUIT & LAYOUT (except /21/22 version)



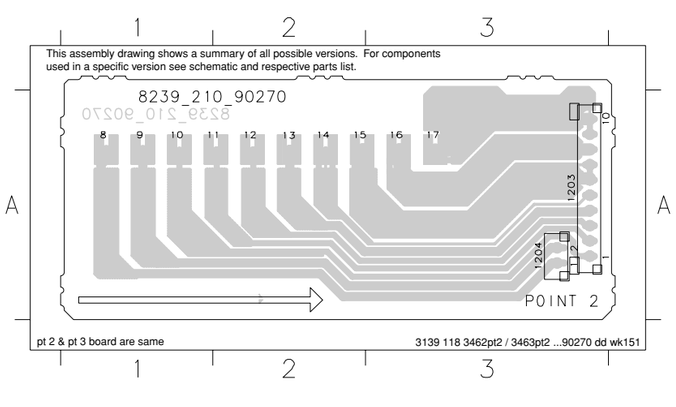
1 B1 2 B1 — 3 B2 4 B2 — 5 B2 6 B3 — 7 B3 1201 B4 — 1202 A4 3208 A4 — 5202 A3 8203 A1 — 9201 B3 9202 A3



TRANSFORMER SECONDARY PART - CIRCUIT & LAYOUT (except /21/22 version)

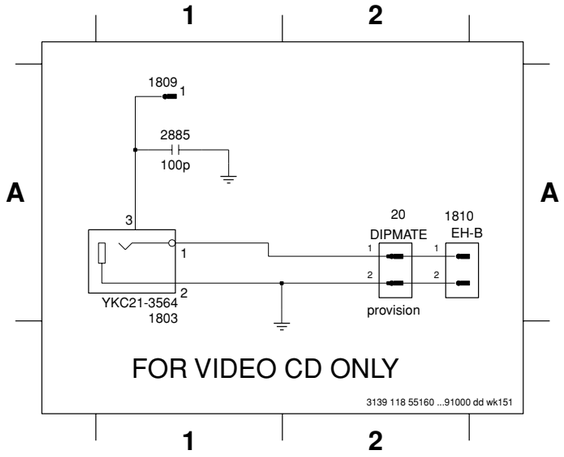


8 A1 9 A1 — 10 A1 11 A1 — 12 A2 13 A2 — 14 A2 15 A2 — 16 A3 17 A3 — 1203 A3 1204 A3

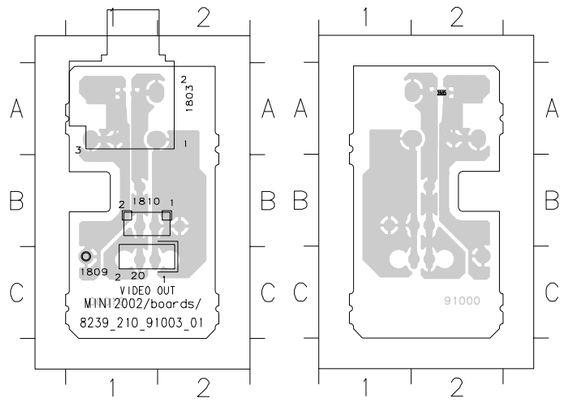

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
8239_210_90270
8 9 10 11 12 13 14 15 16 17
1203
1204
POINT 2
pt 2 & pt 3 board are same
3139 118 3462pt2 / 3463pt2 ...90270 dd wk151

VIDEO OUT PART - CIRCUIT & LAYOUT (for VCD version only)

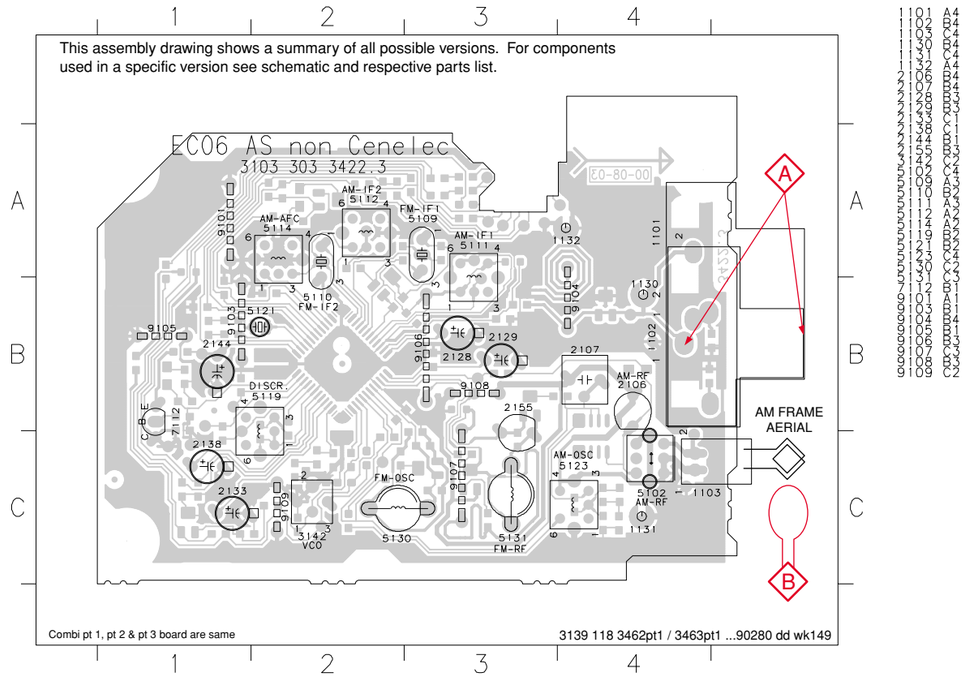
20 A2 — 1803 A1 — 1809 A1 — 1810 A2 — 2885 A1

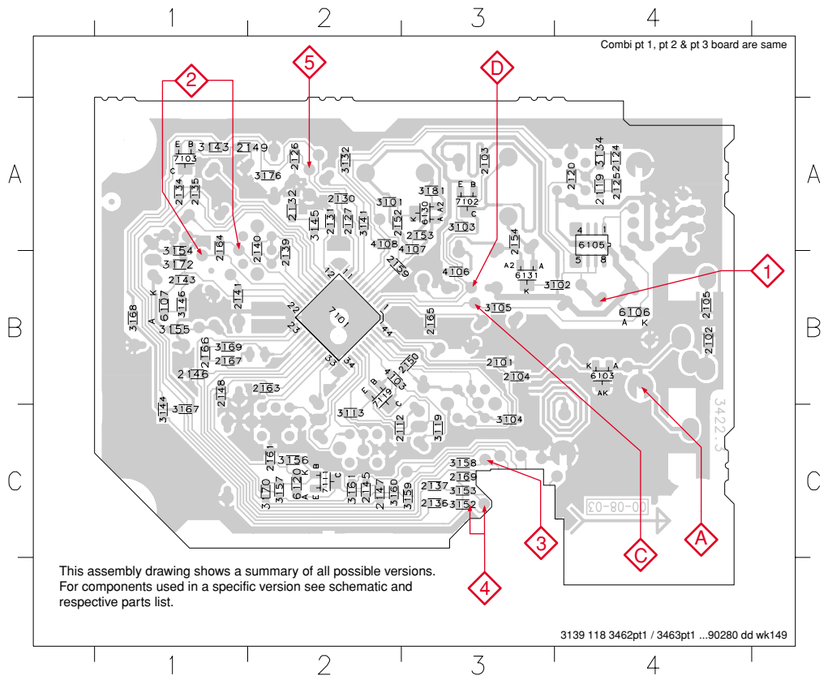


20 C1 1803 A2 — 1809 C1 1810 B1 — 2885 A2



NON-CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
EC06 AS non Cenelec
3103 303 3422.3
AM FRAME AERIAL
Combi pt 1, pt 2 & pt 3 board are same
3139 118 3462pt1 / 3463pt1 ...90280 dd wk149


Combi pt 1, pt 2 & pt 3 board are same
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
3139 118 3462pt1 / 3463pt1 ...90280 dd wk149

Note: This layout drawings are applicable for both pt 1 and pt 2 pc board.

TUNER ADJUSTMENT TABLE (ECO6 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	◇D	IC 7101 pin 21 shortcircuit to block AFC 2141	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A mod=1kHz Δf=±22.5kHz	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz 1)
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 pin 36 220R 100nF	5111	◇5	max. f_o symmetric
			IC 7101 pin 40 220R 100nF see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇5	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 070799

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

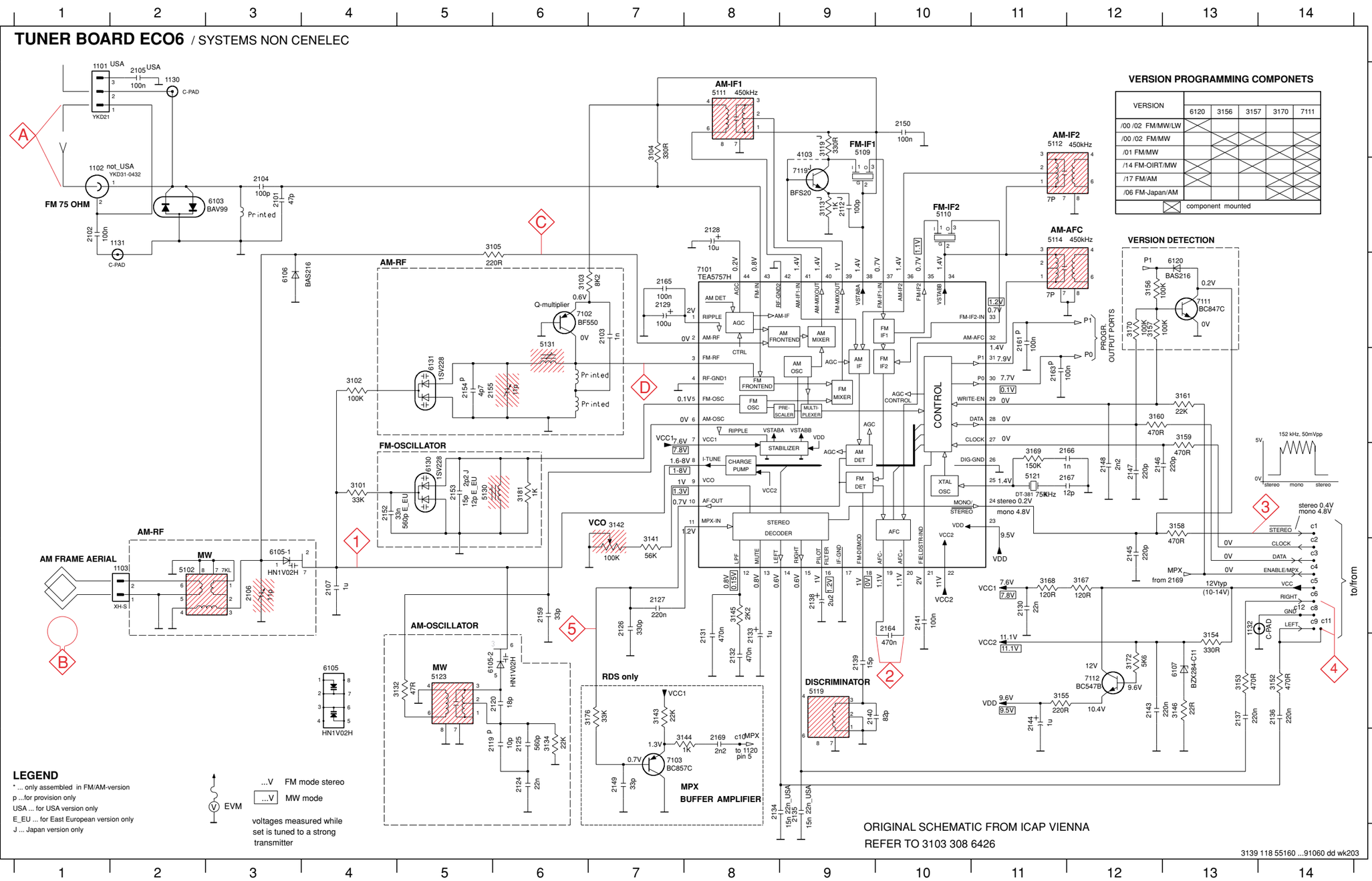
4) MW has to be aligned before LW.

↕ Repeat

11-11

NON-CENELEC TUNER CIRCUIT

TUNER BOARD ECO6 / SYSTEMS NON CENELEC

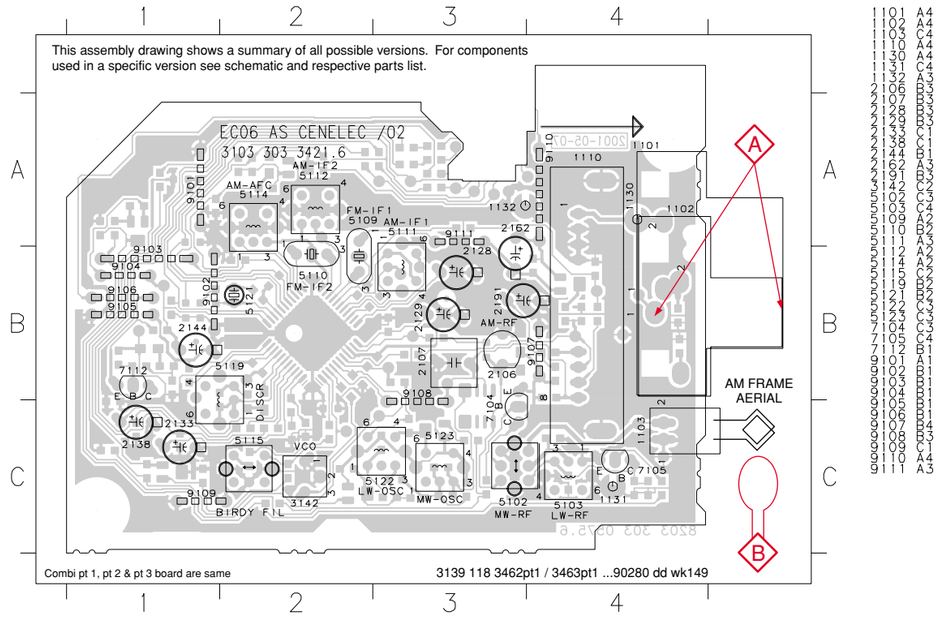


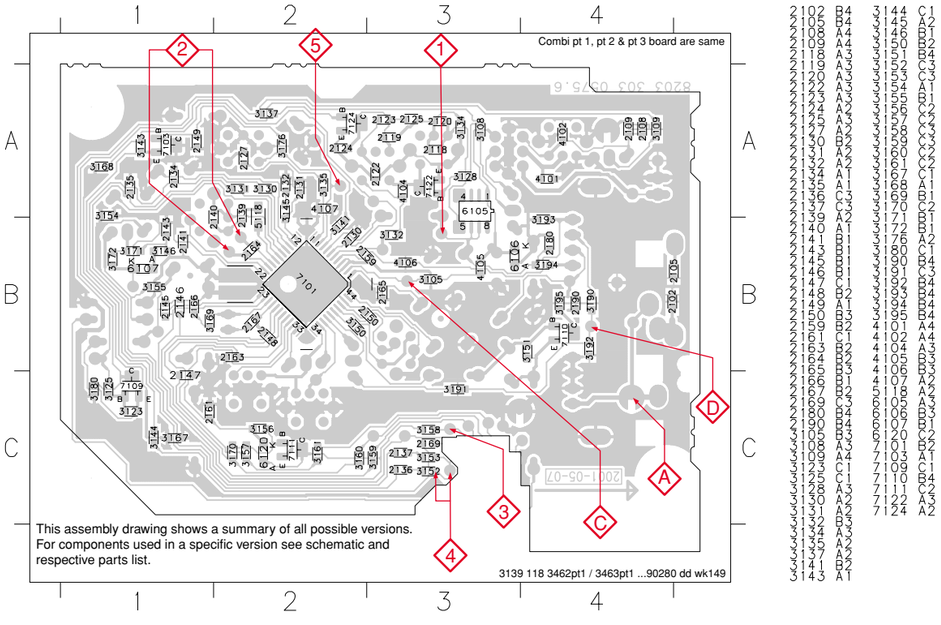
VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	X				
/00 /02 FM/MW		X	X		X
/01 FM/MW		X	X	X	X
/14 FM-OIRT/MW	X				
/17 FM/AM	X			X	
/06 FM-Japan/AM		X	X		X

X component mounted

c1 E14	5119 G9	2128 B8	2159 G7
c2 F14	5121 E11	2129 C7	2161 E11
c3 F14	5123 G5	2130 F11	2163 D11
c4 F14	5130 E5	2131 G8	2164 F10
c5 F14	5131 C6	2132 G8	2165 C7
c6 F14	6103 B2	2133 G8	2166 E12
c8 F14	6105-1 F3	2134 H8	2167 E12
c9 F14	6105-2 G6	2135 H9	2169 H8
c10 H8	6106 C3	2136 G14	3101 E4
c11 F14	6107 G13	2137 G13	3102 D4
c12 F14	6120 C13	2138 F9	3103 C6
1101 A1	6130 E5	2139 G9	3104 A7
1102 B1	6131 D5	2140 G9	3105 B6
1103 F2	7101 C8	2141 F10	3113 B9
1130 A2	7102 C6	2143 G12	3119 A9
1131 B2	7103 H7	2144 G11	3132 G5
1132 G13	7111 C13	2145 F12	3134 H6
2101 B3	7112 G12	2146 E12	3141 F7
2102 B1	7119 B9	2147 E12	3142 E7
2103 C7		2148 E12	3143 G7
2104 B3		2149 H7	3144 H8
2105 A2		2150 A10	3145 F8
2106 F3		2152 E4	3146 G13
2107 F4		2153 E5	3152 G14
2112 B9		2154 D5	3153 G13
2119 H6		2155 D6	3154 G13
2120 G6		2159 F6	3155 G11
2124 H6		2161 C11	3156 C12
2125 H6		2163 D11	3157 C12
2126 F7		2164 F10	3158 E13
2127 F7		2165 C7	3159 D13
2128 B8		2166 E12	3160 D12
2129 C7		2167 E12	3161 D13
2130 F11		2169 H8	3167 F12
2131 G8		3101 E4	3168 F11
2132 G8		3102 D4	3169 E11
2133 G8		3103 C6	3170 C12
2134 H8		3104 A7	3172 G12
2135 H9		3105 B6	3176 G7
2136 G14		3113 B9	3181 E6
2137 G13		3119 A9	4103 A9
2138 F9		3132 G5	5102 F2
2139 G9		3134 H6	5109 A9
2140 G9		3141 F7	5110 B10
2141 F10		3142 E7	5111 A8
2143 G12		3143 G7	5112 A11
2144 G11		3144 H8	5114 B11
2145 F12		3145 F8	
2146 E12		3146 G13	
2147 E12		3152 G14	
2148 E12		3153 G13	
2149 H7		3154 G13	
2150 A10		3155 G11	
2152 E4		3156 C12	
2153 E5		3157 C12	
2154 D5		3158 E13	
2155 D6		3159 D13	
2159 F6		3160 D12	
2161 C11		3161 D13	
2163 D11		3167 F12	
2164 F10		3168 F11	
2165 C7		3169 E11	
2166 E12		3170 C12	
2167 E12		3172 G12	
2169 H8		3176 G7	
3101 E4		3181 E6	
3102 D4		4103 A9	
3103 C6		5102 F2	
3104 A7		5109 A9	
3105 B6		5110 B10	
3113 B9		5111 A8	
3119 A9		5112 A11	
3132 G5		5114 B11	
3134 H6			
3141 F7			
3142 E7			
3143 G7			
3144 H8			
3145 F8			
3146 G13			
3152 G14			
3153 G13			
3154 G13			
3155 G11			
3156 C12			
3157 C12			
3158 E13			
3159 D13			
3160 D12			
3161 D13			
3167 F12			
3168 F11			
3169 E11			
3170 C12			
3172 G12			
3176 G7			
3181 E6			
4103 A9			
5102 F2			
5109 A9			
5110 B10			
5111 A8			
5112 A11			
5114 B11			

CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
ECO6 AS CENELEC /02
3103 303 3421.6
AM FRAME AERIAL
Combi pt 1, pt 2 & pt 3 board are same
3139 118 3462pt1 / 3463pt1 ...90280 dd wk149


Combi pt 1, pt 2 & pt 3 board are same
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic and respective parts list.
3139 118 3462pt1 / 3463pt1 ...90280 dd wk149

TUNER ADJUSTMENT TABLE (**ECO6 Cenelec** FM/MW - and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	◇1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	◇D	IC 7101 pin 21, shortcircuit to block AFC, 2141	5119	◇2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz [1]
FM RF (channel separation)	Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.					
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	◇A	98MHz	IF coil inside FM frontend 1110	◇4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C Δf = ±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 pin 36, 100nF, 220R	5111	◇5	max., f_o symmetric
			IC 7101 pin 40, 100nF, 220R, see remark [2]	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0mV ±2mV
AM RF [3]						
MW	1494kHz	◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇5	max., f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

ECO6 Sys Cenelec, 190599

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

[2] RC network serves for damping the IF-filter while adjusting the other one.

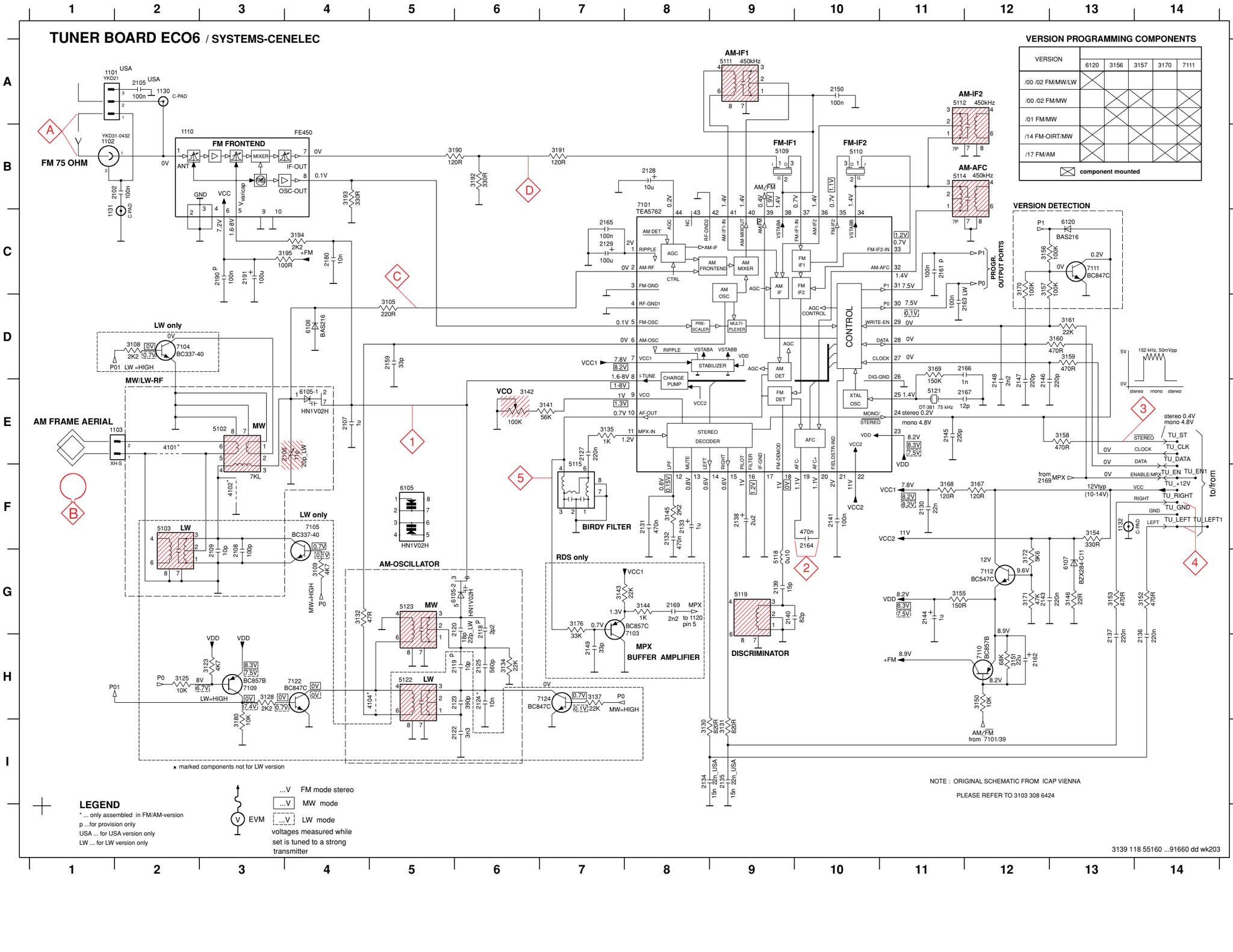
[3] For AM RF adjustments the original frame antenna has to be used! MW has to be aligned before LW.

↕ Repeat

11-13

CENELEC TUNER CIRCUIT

TUNER BOARD ECO6 / SYSTEMS-CENELEC



VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	☒				
/00 /02 FM/MW		☒	☒	☒	☒
/01 FM/MW		☒	☒		
/14 FM-OIRT/MW	☒			☒	☒
/17 FM/AM	☒	☒	☒	☒	☒

☒ component mounted

LEGEND

* ... only assembled in FM/AM-version
p ...for provision only
USA ... for USA version only
LW ... for LW version only

...V FM mode stereo
[...V] MW mode
[...V] LW mode
(V) EVM
voltages measured while set is tuned to a strong transmitter

× marked components not for LW version

AM G13	5118 G9		
FM G13	5119 G9		
1101 A2	5121 E11		
1102 B1	5122 H5		
1103 E2	5123 G5		
1110 B2	6105-1 E4		
1130 A2	6105-2 G6		
1131 C1	6106 D4		
1132 F13	6107 G13		
2102 B2	6120 C13		
2105 A2	7101 B8		
2106 E3	7103 G8		
2107 E4	7104 D2		
2108 G3	7105 F4		
2109 G3	7109 H3		
2118 G6	7110 H12		
2119 H6	7111 C13		
2120 G6	7112 G12		
2122 I6	7122 H4		
2123 H6	7124 H7		
2124 H6	TU_+12V F14		
2125 H6	TU_CLK E14		
2127 E7	TU_DATA E14		
2128 B8	TU_EN F14		
2129 C7	TU_EN1 F14		
2130 F11	TU_GND F14		
2131 F8	TU_LEFT F14		
2132 F8	TU_LEFT1 F14		
2133 F8	TU_RIGHT F14		
2134 I8	TU_ST E14		
2135 I9			
2136 H14			
2137 H13			
2138 F9			
2139 G9			
2140 G9			
2141 F10			
2143 G12			
2144 G11			
2145 E11			
2146 E12			
2147 E12			
2148 E12			
2149 H7			
2150 A10			
2159 D5			
2161 C11			
2162 H12			
2163 D11			
2164 F10			
2165 C7			
2166 D12			
2167 E12			
2169 G8			
2180 C4			
2190 C3			
2191 C3			
3105 D5			
3108 D2			
3109 G4			
3123 H3			
3125 H2			
3128 H3			
3130 I8			
3131 I9			
3132 G4			
3134 H6			
3135 E7			
3137 H7			
3141 E7			
3142 E6			
3143 G7			
3144 G8			
3145 F8			
3146 G13			
3150 H12			
3151 H12			
3152 G14			
3153 G13			
3154 F13			
3155 G11			
3156 C12			
3157 C12			
3158 E13			
3159 D13			
3160 D13			
3161 D13			
3167 F12			
3168 F11			
3169 D11			
3170 C12			
3171 G12			
3172 G12			
3176 G7			
3180 I3			
3190 B6			
3191 B7			
3192 B6			
3193 B4			
3194 C4			
3195 C4			
4101 E2			
4102 F3			
4104 H5			
5102 E3			
5103 F2			
5109 B9			
5110 B10			
5111 A9			
5112 A11			
5114 B11			
5115 F7			

11-14

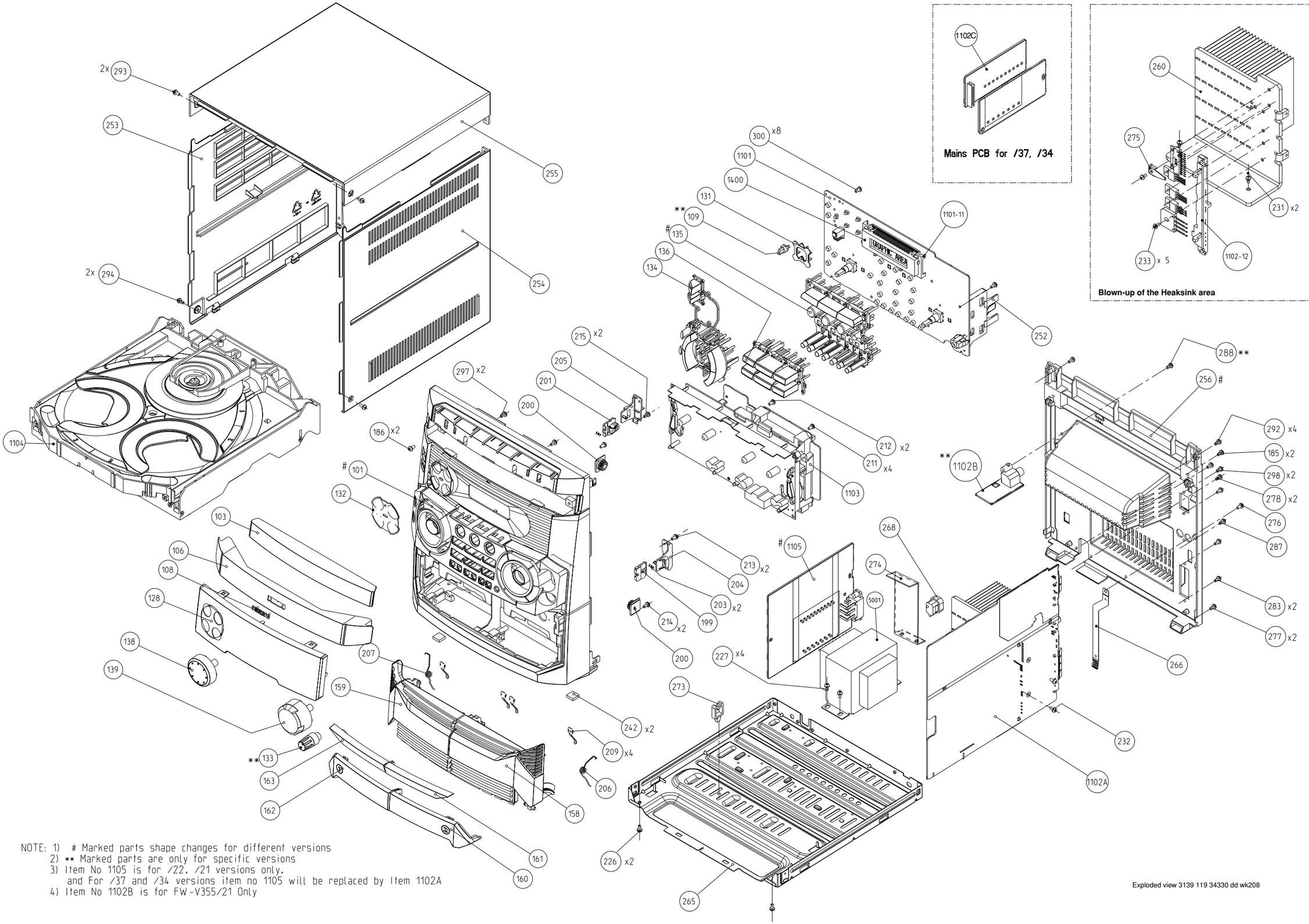
ELECTRICAL PARTS LIST - COMBI BOARD

1215	⚠	994000002955	FUSE RAD LT 5A 250V IEC
1216	⚠	994000001885	FUSE RAD T 2A IEC250V
1217	⚠	994000002957	FUSE RAD LT 315MA 250V
1218	⚠	994000002958	FUSE 1.6 250V VDE
1300		996500016263	SPEAKER TERMINAL 4P
1504		996500014506	SOC CINCH 2P
1563		996500014709	TERMINAL PIN D1
1564		996500014709	TERMINAL PIN D1
1568		996500014709	TERMINAL PIN D1
1803		994000001852	SOC CINCH HIP
2106		482212560101	CER TRIMMER 3P-11P 100V N450
2155		482212560101	CER TRIMMER 3P-11P 100V N450
2211	⚠	994000002953	E-CAP, 3300µF/35V
2216	⚠	994000002952	E-CAP, 4700µF/50V
2229		994000002954	ELEC CAP 6800µF/16V
3142		482210012159	RTRM CAR LIN 100KH
3623	⚠	996500018242	FUSE RES NFR 25A 10Ω
5102		482215771634	MW RF COIL
5109		996500018257	CERAMIC FILTER SFE10.7MS3AZ
5110		996500018257	CERAMIC FILTER SFE10.7MS3AZ
5111		242254944023	IND VER 7mm 7PY 450KHZ
5112		482215770302	IND VAR 7mm 7P 450KHZ
5114		482215770302	IND VAR 7mm 7P 450KHZ
5119		482215711443	OSC COIL
5121		482224210261	X'TAL 75KHz
5123		242254944108	IND VAR 7mm 7PY 796KHz
5130		482215711843	RF COIL 1.5 TURNS
5131		482215711843	RF COIL 1.5 TURNS
5301		994000002947	TURNS COIL
5302		994000002947	TURNS COIL
5303		994000002947	TURNS COIL
5304		994000002947	TURNS COIL
5305		996500019720	FIXED IND 2.2µH TP=52MM
5501		996500019720	FIXED IND 2.2µH TP=52MM
5601		996500019720	FIXED IND 2.2µH TP=52MM
6105		482213083075	DIODE VARICAP HN1V02H-B
6130		482213082833	DIODE 1SV228
6131		482213082833	DIODE 1SV228
6210		994000002949	DIODE GBU602
7101		935174080557	IC TEA5757H/VI
7214		996500016574	IC KIA7812API
7220		994000002948	IC KIA7805API
7301		932217432682	IC AN17830A
7302		994000002951	FET POW STP16NE06FP
7501		932215074668	IC TDA7468D
7600		532220915853	IC NJM4556AM

Note: Only these parts mentioned in the list are normal service parts.

12-1

EXPLODED VIEW - MAIN UNIT



NOTE: 1) # Marked parts shape changes for different versions
2) ** Marked parts are only for specific versions
3) Item No 1105 is for /22, /21 versions only,
and For /37 and /34 versions item no 1105 will be replaced by Item 1102A
4) Item No 1102B is for FW-V355/21 Only

Exploded view 3139 119 34330 dd wk208

MECHANICAL & ACCESSORIES PARTS LIST

101	994000002935	FRONT CAB PRE-ASS'Y
106	994000002936	CDC TRAY PRE-ASS`Y
128	994000002937	WINDOW DISPLAY
133	994000002938	KNOB KARAOKE
134	994000002939	BUTTON SET PWR
135	994000002941	BUTTON SET SRCE
136	994000002942	BUTTON SET CTRL
138	994000002944	KNOB JOG ROTARY
139	994000002943	KNOB VOL ROTARY
253	996500022382	PANEL LEFT
254	996500022383	PANEL RIGHT
255	996500022384	COVER-TOP
256	994000002945	PANEL REAR PRE-ASSY
268	996500018352	BUSHING CORD
385 ⚠	996500014712	MAINS CORD
1103	994000002927	TAPE DECK CWE FF FERRD
	242254945067	AM FRAME AERIAL ANT
	994000002924	REMOTE CONTROL V357
	994000002925	BOX SPK ASS`Y FW-V357/21M
	994000002926	FM ANTENNA WIRE
	994000002971	CD DRIVE VAM2201/16

Note: Only these parts mentioned in the list are normal service parts.

ELECTRICAL PARTS LIST - MISCELLANEOUS

1004	994000002928	FFC 14P 075MM 1.25
1400	994000002933	FFC 30P 180MM 1.25
1402	994000002932	FFC 07P 140MM 1.25
1500	994000002934	FFC 05P 140MM 1.25
1700	994000002929	FFC 07P 220MM 1.25
1800	994000002931	FFC 15P 180MM 1.25
5001 ⚠	994000002915	TFM POWER 76-40 OVS VCD
8001	994000002969	FFC 22P/163/22P 1.0MM
8002	994000002972	FFC 5P 200MM 1.25
	994000002916	MPEG-01B PCB ASS`Y
	994000002967	TAPE PCB ASS'Y
	994000002968	CD PCB ASS`Y
	994000002993	CDC MODULE

Note: Only these parts mentioned in the list are normal service parts.

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SCREW LISTS - MAIN UNIT

185	D3 x 12
186	D3 x 12
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
215	D3 x 12
226	M3 x 6
227	M3 x 6
231	M3 x 10
232	M3 x 10
233	M3 x 10
276	M3 x 6
277	M3 x 10
278	M3 x 6
283	D3 x 12
287	D3 x 12
288	D3 x 12
292	D3 x 12
293	D3 x 12
294	D3 x 10
297	D3 x 12
298	D3 x 12
300	D3 x 12